COAL AGE

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Overlooking the Salaried Man

An Open Letter to Boards of Directors, Presidents and Managing Executives of American Concerns.

Place—Anywhere in America.
Date—The Year of Prosperity.

Dear Sirs:

You know that for some time now, the news of the day has been punctuated with announcements of wage increases. We read that many of these have been granted voluntarily. This shows us that many managements want to share any measure of prosperity with the workers. We gladly recognize and honor this kind of spirit. Some increases we see have been granted after conferences with representatives of labor unions. We note the eight-hour day is getting more recognition than ever before. In fact several states have made it law for underground workers. Of course, it is evident that in the case of some concerns increased pay and recognition of shorter working hours has been due to the presence of organized workers who insisted on receiving a larger division of the earnings.

Can we ask a few questions about these increases and present a few facts relative to our share therein?

Have you observed that many notices of wage increases carry the statement that "Salaried employees will not be affected"? If you think this is not a fact, review your trade journals. You'll find plenty such cases.

Is yours one of the concerns (understand we are not referring only to coal-mining companies) that have given a straight per cent. of increase to all classes of wage earners and only "adjusted." or more likely overlooked altogether the rates for salaried employees? You certainly know that we comprise a pretty fair contingent of your workers, and it is hard to believe you purposely overlooked us.

You know that the compensation paid us is not by any means the equivalent of that paid workers in your operating departments. Why is it you do not consider the training of a business school or collegiate course as valuable as that which gives a mechanic his dexterity?

You know we are not, nor ever have been, a part of any kind of labor union. Our emolument (noble word) is arbitrarily fixed, and generally most of us are paid whatever salary will secure our services. But are we not an integral part of your workers? Certainly we want to be, and feel we ought to be considered as such.

Is it a question of loyalty to the concern? Well, look over your organization. Won't you find engineers, cashiers, paymasters, timekeepers and all the rest of us who stuck to the company when the wage earners went out on a strike? Perhaps you have reinstated and lately increased the wages of some of the very men who once urged the destruction of your property. But you have overlooked some of those who were loyal all the way.

Is it a question of the quality of our work or the number of hours we work? You know that we are not bound by the hours of labor as fixed by your management or decided upon between you and the union. As timekeepers, cost clerks and so on, we work on into the night and there is no question of "Time and a half" for us. In fact we work all the harder as your volume of business increases; but no one ever seems to think that such effort should entitle us to increased salaries as is the case with other workers.

Take the list of your salaried employees and see how long it has been since some of them had a real raise, and figure out the per cent. of increase this division of your workers has received in all the wage advances your company has made.

All we ask is parity with the rest. Our living conditions are no better than those of wage earners. We feel the high cost of living just like they do.

Take our case under advisement. All we want is a "square deal."

Signed,

"THE SALARIED EMPLOYEES."

Ideas and Suggestions

Protect Mine Maps and Plans

By Rufus J. Foster*

I recently had occasion to call on the chief engineer of a prominent anthracite mining company, and while in the drafting room I noticed that the general mine maps, as well as smaller drawings and plans, were either stored in combustible racks, constructed of light pine wood, or were kept in a large pine closet. The drafting room was in the rear portion of an office building, by no means fireproof, and was several floors above the street level. The building is occupied by numerous tenants, either professional men or business firms.

In case of fire in this building, during office hours, conditions are such that the draftsmen might have all they could do to save themselves. A fire at night would be liable to destroy not only the maps and plans, but the engineers' notebooks containing the data from which they were constructed as well.

The general mine maps of this company, as is usually the case, show the old workings in the several seams, great areas of which workings cannot now be resurveyed.

As every mining engineer knows, accurate maps of old workings are absolutely essential to the safe and economic mining of the coal adjacent to such workings.

With both maps and notebooks destroyed, resurveys of all open workings would have to be made, so that as much as possible of the old maps could be reconstructed. The cost of such incomplete maps to this company, which operates several large collieries, would run into thousands of dollars. In addition the loss of the maps of the old workings would cause so much trouble and expense that the future monetary loss would be incalculable. It would probably soon reach an amount that would several times overpay for the erection of a better building than the eight-storied one in which the company has leased offices.

I expressed my opinion on this matter to my friend, the chief engineer, and he replied: "You are absolutely right. I have many times called the attention of our executive officials to the insecurity of our maps and drawings, but they do not seem to realize the conditions that will confront us if they are destroyed, or the enormous expense and length of time necessary to replace such of them as can be replaced. Neither do they realize the liability to loss of both property and life in future operations if we do not have accurate maps of the old workings adjacent to or in seams above or below the live workings."

The case I mention is by no means an exceptional one. While it is true that most large mining companies have fireproof vaults in which to store their maps, drawings and notebooks, there are some that have not. Many of the smaller companies and large individual operating firms are just as careless with their maps, and their loss and inconvenience in case of their destruction will be proportionately great.

Mine maps and the engineers' notebooks should be stored in fireproof vaults, and the mining engineers of such companies as do not provide such storage should be persistent in insisting that such protection be provided. When the executive head is himself a mining engineer, or a practical mining man accustomed to using the work of mining engineers, he will not need much urging. He will see the necessity of protection and will provide it. The mining engineers and operating officials who do not use every effort to convince superior officers of the necessity of protection for mine maps and survey notebooks, are as derelict in their duty to their employers as if they, knowing there was danger from fire to expensive colliery buildings, did not urge and insist on such buildings being protected. In most cases the buildings and their contents can be more readily and cheaply replaced than the mine maps.

*Scranton, Penn.

The Men Who Get Hurt

The chief mine inspector of a large coal company in Pennsylvania submits the following thought to *Coal Age* for use as the basis of an editorial. The suggestion as stated by the inspector is so complete that further comment is unnecessary. Here are his words:

"You can escape automobile accidents all your life, and then be killed by a horse and buggy. How often do we hear of miners who spend years working on pillars and stumps, always laboring in the most dangerous places, only to meet with an accident at last after being transferred to an apparently safe place. After the accident has occurred, we hear everyone say, 'He was an old and experienced miner.' The point is just this: The 'greenie' seldom gets hurt because he is exceedingly careful in every move he makes and generally works with an experienced miner who is forever watching him. As the new man becomes more accustomed to the dangers, he gets more careless and after a while commences to believe it is impossible for him to get hurt. When this thought has sufficiently seated itself in his mind, the way is paved for a serious accident that not only is an affliction to the man, but brings sorrow to all his dependents."

Don't Be a Knocker!

By Samuel Jones*

There is a class of men in all industries who are continually knocking their work, their pay, or their superiors. This is particularly true of coal mining. In the mines where I am working there are three different kinds of knockers: First, there is the man who is dissatisfied with his job but won't quit. He would sooner go around the mines telling other men what they should get for the work they are doing, making them dissatisfied so that they also start knocking sooner or later and cause serious trouble either for the foreman or themselves, but generally both. Second is the man who can run the mine as

*Mine foreman, Shoff mine, Madera, Penn.

well as or better than the men already in charge. Some of the older miners with whom he talks laugh at him, while a few of the younger men believe it. Why doesn't he tell this to the superintendent? Then he would stand a chance of getting the foreman's position, as the management wants the best man at the head. Lastly, there is the type of man who always says things were this way and that way before the present management took hold.

Instead of being a knocker, be a booster. Do what you can to help everybody and everybody will help you. Then, if things do not go right, don't make other men discontented, go up to the foreman and tell him you are quitting because you don't think your work is receiving the proper reward. Almost any foreman hates to lose the straightforward type of man and would adjust matters at the earliest possible moment. Take for a motto—Be a booster; don't knock.

Some Servants of the Law

BY AN ASSISTANT SUPERINTENDENT

The foreigner who came to work in the mines or other industries of this country is in the beginning, as we all know, almost totally ignorant of the laws and institutions of the United States. American methods in the administration of justice are wholly new to him, although he may soon become involved in their operation.

Intemperance or misunderstandings often lead to fights and other disturbances of the peace of the community. Petty grievances are quickly carried into the court of the justice of the peace. Or the theft of a miner's pick may be the cause of an arrest. The foreigner is especially liable to appear in court, because of some simple reason such as those just recited.

What does it mean to a man, especially a foreigner, to come in contact with the average court of the justice of the peace? Is he inspired by the simple and impartial administration of justice? Does he leave the courtroom full of admiration and respect for American judicial methods?

In many instances, one might almost say as a rule, there is altogether lacking the dignity that one likes to associate with so serious a function as the interpretation of the law. The method of procedure is often extremely crude. In fact ignorance may be quite as evident in the courtroom as it was in bringing the case into court.

The place where the trial is held is often such as to give no cause for boasting. The building may be one the surroundings of which violate most of the ordinary principles of cleanliness and decency. The courtroom is often a place equipped with dirty, broken-down furniture, while the floors abound in filth.

What can be said for the justice of the peace himself? Are his friends the wholesome, law-abiding citizens of the community? Oftentimes they are, but in some of our industrial towns they are not. Frequently we note instances where the justice of the peace associates with persons who care little about their own personal conduct or for the welfare of the place wherein they live. The personal appearance of the justice of the peace often betrays his own weaknesses. A face that reveals a love for drink is not likely to be seen on one who is interested in the impartial enforcement of the liquor laws. Nor is it reasonable to expect to find a man habitually dirty in dress and manner and yet deeply interested in clean living. Again, are we not overworking the imagination when we look for anything like moral leadership from a man whose reputation is known publicly to be bad? Yet we often find such men elected to administer the minor laws of our country?

In many places there is need of a higher type of man to occupy the office of justice of the peace. Such men may be secured if those of us who cast our votes for candidates for office demand a higher type and use our votes with that degree of intelligence and freedom that will make our demands felt. Moreover, the call may not be for our votes alone, but for ourselves. It may take courage and it may mean a sacrifice on the part of some who feel qualified to perform the duties of justice of the peace to seek the office. But isn't it worth it?

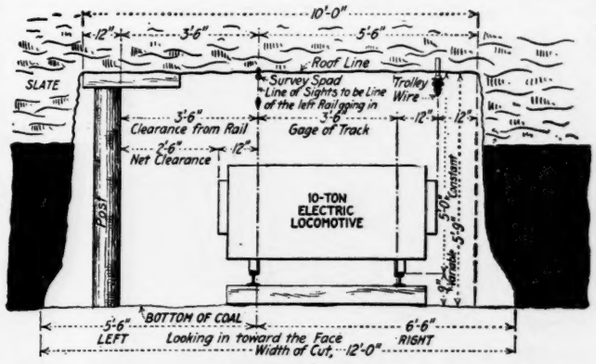
Those Americans who are worthy of the name, desire to uphold the ideals of our country and have the least wish to inspire the future citizens of our commonwealth with the temperate, clean and straightforward character of our public officials, particularly as concerns the enforcement of our laws, may well feel repaid in devoting some of their time and energy in an effort to elevate the personnel of our minor courts of justice.

Safety and Efficiency

BY C. J. FUETTER*

It is true that more than one-half of all mine accidents could be prevented if proper precautions were taken. Mine officials should not only be satisfied to observe all the requirements of the state laws, but should try to improve on them whenever possible.

Most mine laws require the foreman to provide places of refuge on one side of single-track haulage roads, these



DETAILS OF HAULAGE ROAD IN A KENTUCKY MINE

places to be not less than 3 ft. in depth from the side of the mine car, 4 ft. wide and not less than 60 ft. apart.

Why not go a step farther and make a map similar to the one here shown? Of course, such a map would have to be made according to the thickness and height of the seam and the width of the heading. Timbermen, trackmen and electricians should be guided by it. Trolley wire may be hung up 8 in. from the inside of the rail, instead of 12 in. if such a plan is desirable. A system like that here described is employed by the Millers Creek division of the Consolidation Coal Co. at Van-Lear, Ky. This is only a part of the well organized safety-first movement that has been going on in the Miller division. These safety efforts have cut down the list of accidents to a small percentage of what they used to be.

*Van-Lear, Ky.

Handling Water in Underground Workings

By H. S. Geismer*

SYNOPSIS—Pumps in mines are used for two general purposes—gathering and ejection. Gathering pumps are almost always comparatively small and often the service required varies widely while each setup of the machine is more or less temporary. Station or ejection pumps on the other hand are to a considerable degree permanent. They may therefore be designed expressly for the service they are to perform.

There are at the present time four means of handling water that find application in our coal mines—ditches, siphons, water hoists and pumps.

The first two are so well understood that they need mention only.

The third on account of the high first cost of the necessary equipment has only a limited application and may be dismissed with a few words. At some of the anthracite mines where large quantities of water, highly impregnated with acids, have to be handled against comparatively low heads, water hoists, or water bailers, as they are called, have met with considerable favor. They consist of watertight skips or buckets having valves in the bottom, which are raised and lowered in vertical shafts by means of hoists, either steam or electric, similar in all respects to the hoists used for hoisting cages. Sometimes such buckets are suspended below a regular hoisting cage and arranged to take water from a sump just below the hoisting level. Much ingenuity has been displayed in designing water hoists which will operate automatically and many interesting details have been perfected. A description, however, of the different kinds of water hoists because of their limited application is not justified in a general article.

This, then, leaves only pumps for discussion. Because of their universal application to all kinds of underground service, and further because of the great progress made by pump designers during recent years, the subject would seem to justify closer study than it has received at the hands of most mining engineers.

Not many years ago all pumps for coal-mine service were either steam or air actuated, while today in opening new mines electric pumps are used almost exclusively. Let us see if this preference for electric pumps is well founded.

Pumps in mines fall naturally into two divisions—station pumps and gathering pumps. The first are usually rather large machines (700 to 2,000 gal. capacity per min.), and if steam actuated are generally located almost directly underneath a surface boiler plant. Pumps of the second division are mostly of small size (100 to 500 gal. per min. capacity) and are scattered over large areas, thus requiring long transmission lines whether driven by either steam, air or electricity.

Let us first consider station pumps. Since these are located close to their source of power the loss in the transmission of steam or electricity would be almost negligible and a comparison of such pumps resolves itself simply into a balancing of their respective duties figured on the basis of useful work per pound of steam, delivered in one case to the pump direct through a steam line while in the other it reaches the pump through engine, generator, transmission line and motor. Air pumps have never been able to compete with steam-driven machines for main-station service and need not be considered in this comparison.

The actual steam consumption for the most economical type of condensing mine pumps runs from 60 to 80 lb. per horsepower-hour of duty. This figure is an average for a large number of duplex compound and triple-expansion condensing pumps of from 600 to 1,200 gal. per min. in actual service.

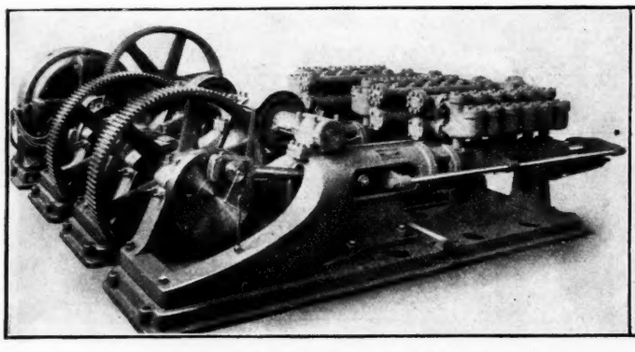


FIG. 1. A TRIPLEX ELECTRIC PLUNGER PUMP

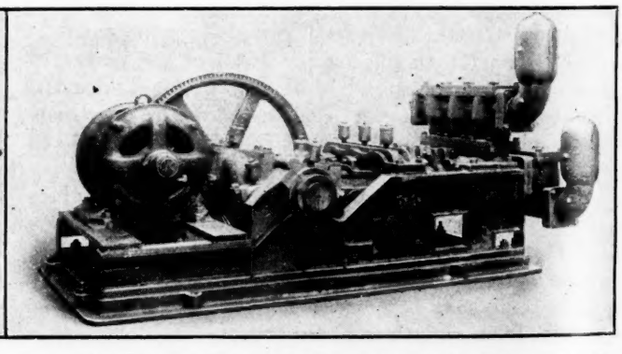


FIG. 2. PUMP OF SIMILAR BUT SIMPLER ARRANGEMENT

If a mine is equipped with electricity the steam consumption per duty horsepower performed by the electric pumps can be arrived at by obtaining the steam consumption of the engine driving the generator. Assuming this to be 30 lb. per indicated horsepower-hour, and assuming 90 per cent. efficiency in the generator, 97½ per cent. efficiency in the transmission line, 90 per cent. efficiency in the motor and 88 per cent. efficiency in the reciprocating electric pump, the total steam consumption per hour per brake horsepower of useful work would be 45 lb.

This figure would apply to small plants; at mines having large electrical installations where condensing engines are used the steam consumption of the engine would not exceed 20 lb. per indicated horsepower-hour, which would reduce the steam consumption per duty horsepower of the

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pump to 30 lb. In other words, the electric pump would require just half as much steam as the steam pump.

As a matter of fact in many cases the steam consumption of mine-station pumps is much larger than the figure given above, because steam consumption in a steam pump hinges largely on the condition and operation of the steam valves and for mining service the steam end of a pump is not apt to receive the attention it requires.

I make no mention here of loss in efficiency due to the condition of the packing in the water end of the steam pump, because that is exactly offset so far as comparison goes by the same condition in the water end of the electric pump. Taking account of all of the factors and assuming that fixed charges (interest, depreciation, taxes, etc.) would amount to 15 per cent. of the original investment, and that coal for boilers costs $1 per ton, steam pumps would have to show a steam consumption not to exceed 30 lb. per hour per duty horsepower to successfully compete with electrically driven station pumps.

The most efficient type of steam pumps of which we have any record are the vertical, triple-expansion, flywheel, pumping engines in use at pumping stations of our large city water-works. These pumps under test show steam consumptions as low as 13 lb. per horsepower per hour, and yet even such engines can be replaced to advantage by electric pumps, providing the electricity can be purchased at a rather low price.

Efficient Pumps Replaced by Centrifugals

The city of Minneapolis, Minn., for example has replaced such pumps by electrically driven centrifugal pumps, which were fully described in the Proceedings of the American Water-Works Association for 1913. The cost of electric current at that plant is 0.387c. per kilowatt-hour, while cost of power at the average coal mine, whether manufactured or purchased from a central station, is 0.8c. per kilowatt-hour. In other words the electric power at Minneapolis, Minn., costs about half as much per unit as does power at coal mines, but the pump replaced in the above instance was about five times as efficient as the steam pump employed at the average mine. The overall efficiency of the electric equipment installed was 71.9 per cent. for the year 1915, being about the same as the efficiency obtained by similar equipment at many mines.

So far, we have discussed only fairly efficient steam pumps such as are used at the main pumping stations. The steam pumps of smaller capacities such as are employed for gathering purposes in coal mines show steam consumptions of over 100 lb. of steam per duty horsepower per hour under the best of conditions, and often this runs to 125 lb. In addition to this there is a waste in the steam line due to leaks and condensation which often amounts to as much as 50 per cent. of the steam supplied. At any mine in which steam or air pumps are used to do all of the pumping an electric generating unit and electric pumps could be purchased to replace them and the entire outlay be paid for in the saving obtained within 18 mo. at most.

The writer has been connected with several mines where the pumping cost has been reduced three-fourths by simply replacing steam pumps with electrically driven machines.

Some engineers prefer steam and air pumps because they can be started, if for any reason they happen to become submerged under water. But electric pumps are even better adapted to such emergencies, provided they are equipped with properly designed motors.

A few years back electric pumps were looked upon with disfavor by some engineers for use in gaseous mines, but with the advent of induction motors and leaded and armored cable for transmission lines, the last argument against the use of the electric pump underground has disappeared.

After deciding to adopt electrical pumping equipment one comes face to face with the problem of determining which type would be most economical. There are two varieties of pump in general use, the centrifugal pump and the reciprocating or so-called power-driven pump. Reciprocating pumps can be used for any mine service, while centrifugal machines do not permit of general application. It might be well therefore to first discuss some of the limitations of the centrifugal type.

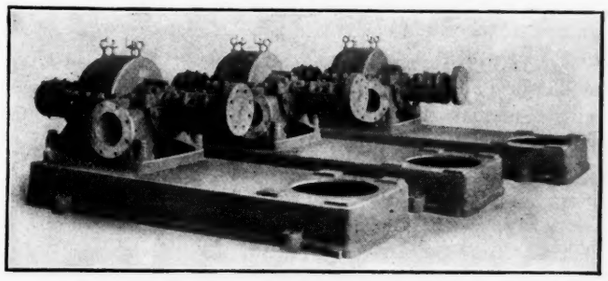


FIG. 3. CENTRIFUGAL PUMPS READY FOR ATTACHMENT OF DRIVING MOTORS

(1) Centrifugal pumps cannot be successfully used in mines where the water is highly acidulous. A bronze mixture can be devised that will successfully resist any acid water, but such an alloy would contain a large percentage of lead, and it is found that when the acid in the water exceeds a certain per cent., the metal to be satisfactory in its acid-resisting qualities would not resist the abrasive action to which the moving parts of a centrifugal pump are subjected, because of the high speed at which such parts have to be rotated. Reciprocating pumps with wood- or cement-lined water ends, however, have been designed to handle such waters successfully irrespective of the amount of acid carried in solution.

(2) Any centrifugal pump is designed especially for the duty that it will be required to perform; that is, a certain number of gallons per minute against a uniform head. While it would be possible to use the pump under varying conditions as to output and head if driven by a variable-speed motor, the machine would not give the same efficiency as when working under the conditions for which it was designed. The centrifugal pump is admirably adapted for mine-station work, but is not so well suited for gathering purposes, where there is apt to be large variation in the conditions under which it is to work.

Centrifugal pumps have been designed for mine-sinking service. The remarks noted above about the changes in efficiency still apply, but efficiency is not the most important item in a mine sinker pump. Centrifugal pumps are well adapted for use in connection with sinking shafts because they have no valves to get out of order. They also do away with the objectionable steam pipes. They also require less room in the shaft and in the pipe compartment, as they do not require steam and exhaust lines.

(3) Centrifugal pumps do not work successfully unless they can be installed with short suction lines and also with practically no suction lift. This is due to the fact that the pump must be kept primed and it is a difficult

matter to keep a long suction line in a mine or a suction line having a considerable lift thus primed. Gathering pumps as a rule require long suction lines, which accounts for the complaints often made against centrifugal pumps when used for this service.

Since centrifugal pumps are best adapted for station service we will make a comparison between centrifugal pumps and reciprocating pumps for such service.

Reciprocating pumps with capacities ranging from 500 to 2,000 gal. per min. can be obtained with guaranteed mechanical efficiencies of from 75 to 91 per cent. For sizes larger than 700 gal. per min. there are several makers who will guarantee 88 per cent. or better. Centrifugal pumps of the same capacities give efficiencies of from 63 to 75 per cent.

The first cost of the reciprocating pump with the motor will be in the neighborhood of five times as much as that of the centrifugal pump, with its motor. It then becomes a question of balancing the larger power cost necessary to operate the centrifugal with the higher operating cost of the reciprocating pump due to the fixed charge resulting from the larger initial investment and a higher maintenance cost. It will be found that if the cost of the current furnished to the pump exceeds 0.5c. per kilowatt-hour the reciprocating pump has the advantage provided both would be required to operate continuously. If, however, the pump would be operated only part of the time, the fixed charge figured down to gallons of water delivered increases rapidly on the reciprocating type of pump, and in that case the net operating cost of the centrifugal machine will be lower. At many mines reserve pumps are considered a necessity, and for that service the centrifugal pump has the advantage because the fixed charge inherited from the initial investment may become the largest item of the operating expense. When the operating cost between the two types of pumps is about equal, I give the centrifugal pump the preference because it is much easier to keep this type of machine up to its initial efficiency. In the comparison above, mention was made of cost of maintenance; it has been my experience that as between the two types a reciprocating pump in the sizes mentioned will cost anywhere from $500 to $1,000 per year more to maintain. Centrifugals require no packing, while this is a large item of expense in the plunger type. The flexible coupling between the motor and pump on the reciprocating type is also expensive to maintain because of the jerky motion inherent in the construction of the pump.

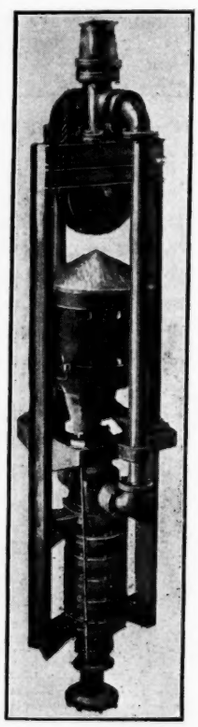


FIG. 4. CENTRIFUGAL SINKING PUMP

Another source of trouble and expense with the reciprocating machine and one which is not found in the centrifugal pump is the surging of the water when the discharge lines are long. This is especially true if the water which the suction line enters is rather shallow, or if the joints in the suction line cannot be kept tight. When this surging arises from a combined action of air and the uneven flow of water through the pump, it is known as water hammer. Water hammer if allowed to continue will soon wreck almost any discharge line and yet at times it is overcome with great difficulty.

While on the subject of discharge lines it might be well to note that all types of electrically driven pumps working against high heads require check and gate valves on the discharge lines just beyond the connection to the pump; in the reciprocating type this is necessary so that the pump may be relieved of the discharge head when starting and in the centrifugal type these valves are required to prevent the pump from draining the discharge line and also to furnish a handy supply of water under pressure for priming the pump and cooling the bearings.

There are considerations which sometimes lead to the adoption of the centrifugal pump as against the power-driven machine for station service even when the actual cost of operating would be greater. For example: Power-driven pumps are much larger and heavier than centrifugal machines of the same capacity. This difference on the larger sizes is almost as ten to one. It is, therefore, possible to install centrifugal pumps in places where it would be practically impossible to install a power pump. Again, since the first cost of the reciprocating pump and motor installed is at least five times that of the centrifugal pump, a small company might find it possible to raise money enough for a centrifugal installation, while a reciprocating unit would be out of the question.

At this point it might be well to answer some of the objections often urged against the centrifugal type by persons who are not fully posted on the subject. When multi-stage centrifugal pumps were first put on the market they did not maintain their original efficiencies, but that objection has been overcome by changes in the design of wearing rings. These rings can be replaced at a small cost. I am familiar with several centrifugal pumps which have been in use in mines for periods of from two to three years without showing any reduction in efficiency and which have moreover required practically no outlay for repairs.

In this connection reference to the report of the chief engineer of the city of Minneapolis for the year 1915, is interesting. Two centrifugal pumps of 20,000,000 gal. per day capacity each are there installed. These machines were purchased in 1912, and for the year 1915, the average overall efficiency was 71.9 per cent. They pump against an average head of 248.29 ft.

Again, centrifugal pumps have developed bearing troubles, but this can generally be traced to failure on the part of the purchaser to post the manufacturer as to actual working conditions. For example: Water-cooled bearings should not receive their supply of water from the main discharge line if the water therein contains a high percentage of fine coal dust; and yet because a manufacturer sends out a pump with the bearings connected in that manner, not having been notified of the conditions, the purchaser goes ahead and uses it until the bearings develop trouble and then condemns the pump.

For all uses underground other than permanent station service, the various forms of power pumps are more flexible than the centrifugals and are generally given the preference. Even where the variations in head are not sufficient to be given consideration, the troubles inherent in long suction lines as mentioned in another part of this paper

generally make centrifugals objectionable for purposes other than main station service.

Within the past few years efficient triplex pumps (vertical and horizontal) of small size have been designed which give efficiencies almost as high as were previously obtained with the larger sizes. Some types are driven with single reduction herringbone gears and are so designed that they can be operated at high speeds, which make them especially suitable for motor drive.

Determining the Size of Discharge Lines

After the most suitable type of pumping equipment has been chosen there are a number of other matters that require consideration. One of the most important is the size of the discharge line. For mine service the discharge lines are often of considerable length and the increased friction caused by too small a pipe line often increases the operating cost to an almost unbelievable amount. For example: Pumping 1,000 gal. of water per min. through a 6-in. pipe creates a friction head of 9 ft. per 100 ft. of length. The same quantity through an 8-in. pipe creates a head of 2.17 ft. per 100 ft. of length. This same quantity through a 12-in. pipe creates a friction head of 0.304 ft. per 100 ft. of length.

As the quantity of water to be handled in a mine increases, larger pumps are often purchased without making calculations as to the necessity of supplying larger discharge lines. Instances are common where more power is actually required to overcome unnecessary friction in pipe lines than would be necessary for the entire pumping duty under more favorable conditions.

Getting up a schedule for pumping hours so as to obtain the most favorable load factor is another matter of the utmost importance especially where the current is purchased from central stations. The plan which works out best as a rule, is to handle the water with gathering pumps to main sumps during the day, and then work the station pumps from the main sumps to the outside at night.

We have seen what a marked effect the length and the size of the discharge line may have on the power bill. In many mines it is possible to eliminate long discharge lines by means of bore holes to the surface. This is especially true in flat seams with comparatively shallow cover. Bore holes not exceeding 14 in. in diameter can be drilled at a cost of from $3 to $5 per ft., depending upon the hardness of the overlying strata, and it is an easy matter to figure the consequent reduction in head and the resulting saving in power that can be effected thereby.

Since in many coal mines as much as 15 tons of water must be handled for each ton of coal produced, it should be apparent that the success of the operation may hinge on the successful handling of the water; in spite of that fact, there are numbers of large operations in which no systematic study has ever been made of the entire pumping system. In the beginning probably one or two pumps were required, and from time to time others have been added. The result is a system of ample capacity but of extremely low efficiency.

⁂

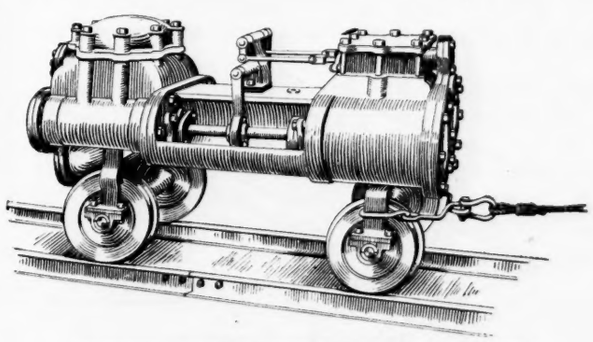
A Witness Before the British Royal Commission expressed the view that if the undercutting was made beneath the seam with a pick, the quantity of large coal would be greater than if made by a machine in the coal itself. In the working of many seams there is a great waste going on. When the men are allowed to undercut in the coal, it is easier to get it than by undercutting in the floor. Of course, if the coal will coke, the small coal is then available for coking; but if it has to be sold as fine coal at a very much lower price, it is so much valuable fuel wasted or deteriorated.

An Improvised Sinking Pump for Dewatering Slopes

By Frederick W. Foote

An old steep slope had to be dewatered and retimbered for examination purposes. The equipment cost was to be charged against the examination, so that it had to be kept at a minimum. The question of pumping was an important one, as the inflow of water was considerable.

A second-hand Worthington pump having a capacity of 50 gal. per min. was bought for $60. The base of the pump was bolted on two sets of wheels and axles,



METHOD OF MOUNTING PUMP ON TRUCKS

and a shackle was fastened to the lower part of the frame. This was done at the shop for $25, making the cost of the mounted pump $85. Wooden track was run down on the timbering. By means of flexible connections the water was lowered until a new set of timbering and headers were placed. The water was then pumped out as far as the suction would permit, and the pump was disconnected and let down to its new position and the piping reconnected. By the time the water had risen to the bottom of the headers the pump was in operation again. The water rose at the rate of about 2 ft. per hr., so that the pump could be idle long enough for the connections to be changed. By this means a slope 130 ft. deep was successfully dewatered at a reasonable cost both for initial expense and for operation.—*Engineering and Mining Journal.*

⁂

Discussing the Importance of Mine-Air Analysis in a lecture before the Midland branch of the National Association of Colliery Managers, Prof. W. H. McMillan, of the University College of Nottingham, indicated four directions in which valuable information would be gathered by systematic analysis: (1) The exact amounts of noxious and dangerous gases evolved in the various sections and splits; (2) whether the ventilating currents are being distributed to the best advantage; (3) whether the regulations are being adhered to, and the required standard of ventilation being maintained; (4) early indications of heating and localizing same—also a valuable adjunct in fighting fires which have broken out.

⁂

If a Shaft Is To Be Used 20 Years or more it is desirable to line it with brick, says Mine Inspector Robert McLaren before the Mining Institute of Scotland. In course of time the woodwork in a shaft rots, and then it has to be constantly repaired. When the woodwork is in a state of disrepair through decay, fatal accidents may not infrequently occur in the shaft. At the same meeting James Black referred to a shaft having two guide ropes on the outside of each cage and two buffer ropes between them. He pointed out that what has to be guarded against is not so much the swinging of the ropes as the twisting, because, as a matter of fact, the swinging arises from the twisting. In view of this it is advisable to have the buffer ropes as far apart as possible.

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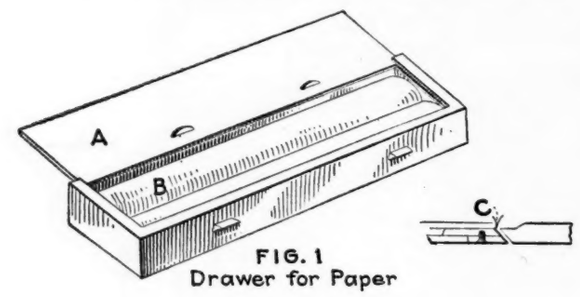

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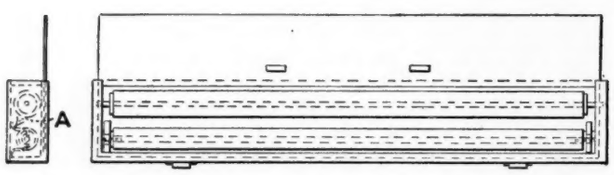

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When we examine the human eye we see beneath the clear transparent cornea a circular colored portion known as the iris. In the center of the iris is an opening called the pupil. This opening has the property of enlarging or contracting, according to the amount of light striking the eye. Thus, when we pass from a dark room into a brilliantly lighted one, the pupil contracts. It is significant that the contraction in passing from darkness into bright light is accomplished comparatively slowly.

Close behind the pupil in the human eye lies the crystalline lens, the function of which is similar to that of a lens in a camera. There is, however, an important difference in operation. The clearness of the image formed by the lens of a camera is maintained whether the object is far or near, by changing the distance between the lens and the ground glass, or sensitized plate. Obviously, in the human eye such changes cannot be made. The clear focus of near or distant objects is therefore accomplished by changes in the curvature of the crystalline lens. Around the outside of this lens runs a ligament, and this ligament is attached to the ciliary muscle. By contraction or relaxation of the ciliary muscle a greater or lesser curvature of the lens is accomplished.

The crystalline lens is nonachromatic. When white light, which is made up of rays of all colors, is reflected from an object to the eye, the blue and violet rays are brought to a focus in front of the retina, and the red rays are directed toward an imaginary focus behind the retina. The red, blue and violet rays serve therefore to blur the otherwise sharp image formed on the retina by the yellow rays.

Now, when the object is illuminated by monochromatic light—that is, by a light of a single color—the rays are brought to a sharp focus on the retina and there is no blurring effect. In other words, the nonachromatic lens can adapt itself to any one color of light, but in the presence of light of all colors, combined in approximately the proportion of white light, it adapts itself to the yellow rays only.

Research has conclusively established that monochromatic light enables detail to be distinctly seen at a lower intensity of illumination than when the object is viewed by white light. It has also been established that different colors of monochromatic light vary in their power to disclose detail. The power of disclosing maximum detail with minimum illumination seems to be possessed by a golden-yellow color, and we can consequently see more distinctly with the same intensity of light, or equally distinctly with less illumination, if that light be golden-yellow.

In considering the question of headlights, it must be borne in mind that the human eye when constantly subjected to an intense, white light reflected from the road quickly loses its efficiency. In other words, the brilliancy of the light itself reflected back into the eye of the locomotive driver soon lowers the efficiency of the eye to a point where the ability to see is less than it would be if the light were less brilliant. The lowering of the eye's efficiency depends upon the total amount of light which enters the eye, and upon the angle with the line of vision at which each integral portion of light enters the eye.

It has been observed that a small intensity of light entering the eye along the line of vision materially cuts down the efficiency of sight. When the intensity of the beam reaches 300 cp. the efficiency has been tremendously reduced; and when a beam of several thousand candlepower shines directly into the eye, it is impossible for one to see anything in his path. Research has proved that an increase of from 20 cp. even to 300 cp. in the beam of light entering the eye lowers the efficiency of sight from 70 per cent. to 12 per cent. And this lowering of efficiency is little affected by the distance of the light source or light-reflecting object from the eye.

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In "Golden Glow" headlights, searchlights and projectors, manufactured by the Electric Service Supplies Co., Philadelphia, Penn., nonblinding effect and increased visuality are secured by altering the quality of the light given by the incandescent lamp, and by this means the coloring and irritating effects are greatly reduced without appreciably lessening the illuminating qualities.

The colored glass lens that is used subtracts from the beam of light given by the incandescent bulb all of the rays above the green—that is, the violet and the blue—and passes all of those colors below it, so that while the light given by the filament of the lamp itself is a brilliant white, the beam projected from the headlight is a golden-yellow. Because of the fact that a beam of light from this type of lamp is soft, mellow and free from glare, it does not, at first sight, impress one as being as powerful as the striking, brilliant, dazzling rays from an arc lamp. But riding behind the lamp one is soon impressed with the detail with which objects can be observed, and the entire freedom from tiring of the eyes, due to the quality and the steadiness of the light.

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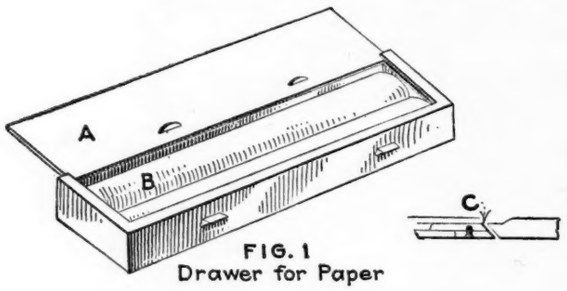

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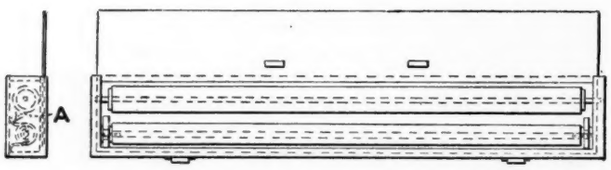

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"I hardly knowed what to do; but coming to a crosscut where there was a canvas stopping, I blowed my light out and slipped through into the aircourse—and walked right into a water 'ole, up to me knees.

"That'd never do, for I was soon shivering with the cold. I happened to think of the little oil lamp I had in my pocket—the one I use to light up with when I charge my carbide lamp.

" 'So,' I says to meself, 'I'll light her up and put away me carbide lamp. Then I'll go around again—mebbe he'll never know me.'

"After lighting up I waded in water to the head of the aircourse, and out through the top crosscut onto the heading. There he was, fuming and storming.

" 'Where ye going?' he says, nastly-like, when he seen me.

" 'Why, I'm looking for the driver,' says I. 'I ain't had a car this morning yet.'

" 'What?' he says. 'Ain't had a car yet? Get after that 'onery bankboss.'

" 'No use, mister,' says I. 'I've told him lots of times. My place has a rotten top, too, and there's no props in.'

"He shook his head. 'What a bankboss! Wait till I see him!'

"And just then he spies my feet. 'Where you been?' he asks.

"I looked at him helpless-like. 'There's water up to my knees in my place, an' I can't get the bankboss to have a look at it.'

" 'Well,' says he. 'Up to your knees in water, rotten top, no props, no cars to get, and no bankboss to be found! That cuss must put in *all* his time at the sand fire.'

"He thought for another moment, and then asked, 'Where to goodness is that place of yours, buddy?'

" 'Way down on the other side of the aircourse,' says I. 'It's a sight of a way down thar, and beastly wet, too.'

" 'I'd like to see that place, mate,' he started. But then he remembered something. 'But, by Heck, I got to catch that feller with the carbide lamp! He's swapping powder for coal, he is. He'll blow ye all to blazes some of these days. I'll clip *his* wings when I catch him.'

" 'Yes,' says I, 'I watched that feller many a time. But there's the driver coming, mister. Ye'd better jump onto that car, an' ye'll catch him down the entry.'

"He jumped onto the car and was soon out of sight. But I could hear him shouting: 'Take care, buddy! Watch that bad top, and keep yer props in close. Won't I lay it into that bankboss!'

"When the ole feller got out of the way, old Jack Blades come out of the aircourse, where he'd been listening.

" 'Sure fluked the ole feller this time. But,' he warned me, 'ye had a narrer squeak.'

" 'Why, I'm going to try her again, boy,' I says, 'cos I never was flamgasted with a shot like that afore.'

"Jack insisted on me using one of his squibs, so I fixed up the hole with my needle, and he put in his squib and lit her up—but she missed again.

" 'You don't know how to luminate them kind of holes,' says I. 'Ye want to bite the end of the squib off and give her a chance to plumb right in, afore she wettens up again.'

"He said he saw a man blow his head off doing that, but I fixed the short squib in, shouted for him to run, and lit her up.

"But we didn't have time to jump. Afore we got turned round there was the tarnalest norashun ever ye heard. I felt myself flying, with smoke and fire all round me, and all kinds of stars shooting in front of my eyes.

"And then everything got dark and silent. After a while I gathered up my dazed wits, and, feeling round, found I was lying over agin the far rib, with a gash in my head and a shoulder paining like mad.

"As the smoke cleared away I heard Jack pulling hisself together out in the middle of the track, and he struck a light. He was raising all kinds of Cain about his nose bumping the ties. I tried to raise myself up, but found I couldn't move my right leg. It felt awful numb.

"When Jack brought his light over we discovered the props had flown like matchsticks and a slab of slate had dropped on my leg. Jack got a tie and lifted the slate, and I tried to draw my leg out. But there was nothing doing; she was broken clean across the shin-bones. Finally Jack dragged me out. There warn't a piece of coal in the place—even the small pile of cuttings was clean gone.

" 'Why,' says I, 'that's the smotheringest shot ever I did see—but oh, Lawd! I wish I didn't feel so bad.'

"It wasn't long afore the driver come up. 'What blamed fool fired that windy shot? That's just what ole Jimson said was going to happen.'

"When the driver seen how I was fixed he helped Jack put me into the car, and they took me down to the parting.

"And the bankboss didn't lose no time getting there. I heard him shouting to the driver: 'Who's been fluking ole Jimson, and telling all them infarnal lies? I'm going to fire that feller out right now. Tell him to gather up his tools and get out of here!'

"The driver looked up at me in a puzzle. 'He's on the seat,' he says to the bankboss, 'but he ain't going to run away.'

"Then I heard the boss coming, an' he sure was primed for action.

" 'Boss,' says I, wanting to get the first word in, 'I'm the feller that got past the ole man, but ye can bet yer bottom dollar I ain't proud of it. It'll be a lesson to me the rest of my life.'

" 'What! That you Sam?' says the boss. 'Ye tried agin and got her off, did ye? And she kicked yer, did she? Well, get a car, boys. Get him home as quick as ye can, and send for the doctor. He's going to have a little vacation.' "

COMING MEETINGS

American Chemical Society will hold its annual meeting Sept. 25-30 in New York City. Secretary, Charles L. Parsons, Bureau of Mines, Washington, D. C.

National Safety Council will hold its next meeting in Detroit, Mich., Oct. 17-20. Secretary, W. H. Cameron, Continental and Commercial Bank Building, Chicago, Ill.

American Electrochemical Society will hold its annual meeting Sept. 28-30 in New York City. Secretary, Prof. Joseph W. Richards, Lehigh University, South Bethlehem, Penn.

The American Mining Congress will hold its 19th annual session during the week beginning Nov. 13, 1916, at Chicago, Ill. Secretary, James F. Callbreath, Munsey Building, Washington, D. C.

National Exposition of Chemical Industries will be held at the Grand Central Palace, New York City, Sept. 25-30, 1916. Managers, Charles F. Roth and Adriaan Nagelvoort, Grand Central Palace, New York City.

New York State Coal Merchants' Association will hold its annual convention Sept. 21-24 at the United States Hotel, Saratoga Springs, N. Y. During the convention addresses will be given on the most uptodate time-saving methods for both office and yard. Secretary, L. V. Shepard, Elmira, N. Y.

Correct Use of Explosives in Blasting Coal

By G. L. Yaste*

A thorough knowledge of explosives and their use in different kinds of mining work is of the utmost importance to all connected with the industry. They should understand the nature of the many varieties of explosives employed, and the adaptation of each to the different kinds of work to be performed. Some explosives are quick and violent in their action while others are slower and develop their energy gradually. The one class is adapted for use in blasting rock and hard coal, while the other is suited to soft coals and to pillar work.

Many have not learned to distinguish between the action of small and coarse-grained common blasting powder. All such powders, fine or coarse, are known as "deflagrating" explosives for they burn fast instead of detonating. The ignition starts upon the outside of each kernel and burns inward to the heart. One grain ignites its neighbors, and the ignition travels in this way, from kernel to kernel.

It is easy to see that if a number of large-sized grains of this powder are placed in a drill hole and ignited by a fuse, the explosion will not take place instantaneously. The burning of the first kernel will generate a certain amount of gas and the volume and pressure of the evolved gas will increase as the ignition progresses until it is sufficient to tear the coal apart or to burst the confining walls. When the pressure has reached this point the audible explosion takes place.

Now, it is evident that if too much powder has been put into the drill hole, disruption will take place before the powder is all burned and, as a consequence, some of the explosive, while still ignited, will be thrown out into the air of the mine workings. This causes a large amount of flame and the energy of the burning powder is largely expended upon the air instead of being consumed in mechanical work upon the coal. This result is what is termed a "blown-out" shot.

The use of too fine grained a powder in soft coal results in blowing the coal to pieces. This often entails a loss to the miner and there is also danger resulting from the fine dust produced becoming ignited in the flame of the blast.

The stemming or tamping is another matter of importance. It is always necessary that this should be strong enough to offer a resistance to the charge equal to that of the hole walls. Where the stemming is too short it will yield before the development of the explosive force is sufficient to rend the walls. This causes a blown-out shot. Similar results occur if the diameter of a drill hole is too large in proportion to the depth of stemming.

The ratio of the diameter of a drill hole to the depth of stemming is, then, an important matter. Drill holes in soft coal may be made from 2½ in. to sometimes 3 in. in diameter, but the larger grained powders are then employed, the holes being longer and the charge placed deeper than in hard coals. Fine-grained powders are usually used in coal in small charges, and in holes of small diameter. It is better in this case to use a number of small charges distributed through the seam, than to depend upon a heavier single charge, since the small charges distributed at different points will exercise a more uniform pressure and result in better breaking of the coal.

The practice of stemming a hole with coal dust or fine coal taken from the floor of the room is pernicious and, I am glad to say, not indulged in longer by intelligent miners.

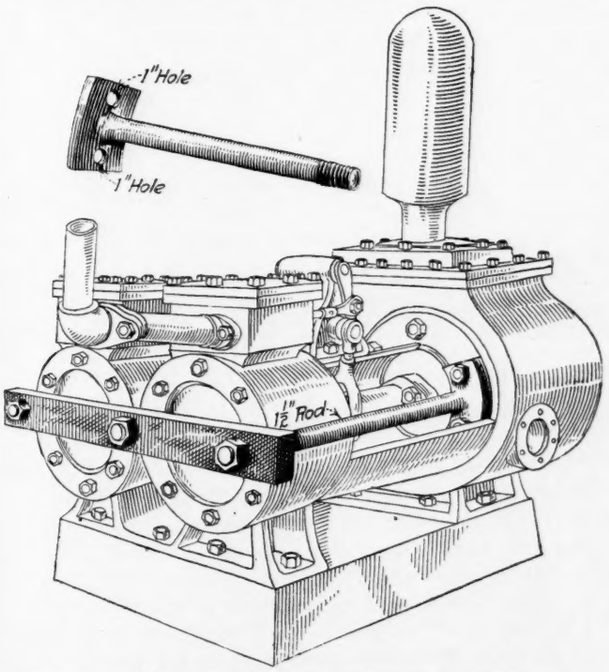
Wooden wedges have sometimes been used to throw down coal. Wedges of soft, dry pine were driven between the roof and the coal which had been previously undermined. The wedges were then moistened with water and their swelling served to break down the coal. These methods, however, cannot be considered at the present day, a more speedy and effective process being required.

*Lonaconing, Md.

Pump-Frame Reinforcement

Trouble was experienced with the breaking of the frame distance piece between the cylinders of two duplex boiler-feed pumps. This was evidently caused by insufficient material, and the engineer took that view of the case.

This occasional breakage was not only a menace to the continuous operation of the plant, but was also a source of worry to all concerned. As a precaution against a recurrence of the trouble, the engineer had three 1½-in. rods made with a tie head forged on one end and the other end threaded. The tie heads were drilled for 1-in. capscrews. A bar of forged steel was made 2¼ in. thick and long enough to reach across the steam-cylinder heads of the pump, allowing for a 1½-in. hole at each end and one for the center rod.



PUMP FRAME REINFORCED WITH STAY RODS

The holes in the tie-head end of the brace were spaced so that the capscrews would align with the stud-bolt holes in the distance piece. When the job was completed, the pump was stayed as shown in the illustration, the stay rods being bolted at one end and passing through the forged cross-piece at the other. When the nuts were tightened, the distance pieces were relieved of a part of the strain to which they were subjected, and owing to the stay rod's assistance none are now being broken.—*Power.*

When Machines Are Soldiering

SYNOPSIS—Machines, like men, do not work all the time, and if we kept track of their time just as we do of that of the men, we might find the care more than justified. An inefficient, broken-down, soldiering machine lowers output, wastes power, absorbs supervision expense and causes dissatisfaction among the men.

Many coal-mining companies count the number of men who go into the mine each morning and, with this figure to work from, estimate the number of cars or tons the mine will produce for that day. If you were to go into the general office of almost any large coal company after 9 or 10 o'clock in the morning, you would be able to find out the number of men working at each mine. But go further and ask the clerks how many locomotives are in operation or how many machines are in condition to cut coal or how many pumps are out of commission, and you will find that no one knows. The officials can tell you how much they pay each miner for his coal, but can they tell you how much they spend for each motor or machine per ton of coal mined?

Most companies have a system of some kind which tells them how much they have spent for supplies and materials, but they do not know on which motor or machine or pump those supplies were used, or how many hours a day these machines worked, or how much the production was lowered because of breakdowns. If these companies had a man who would not do his work or worked only a few days a week, they would soon discharge him; but they will stick to a piece of machinery that is worn out or incapable of doing its share and spend good money on it with no chance of getting results.

Each Machine Should Do an Honest Day's Work

In these days of high cost of production and shortage of labor, it pays well to have the machinery in shape to run a full day when the mine is working. By this means whatever men are in the mine are given a chance to produce some coal, and the cost of production is considerably cheapened because repair costs are reduced to a minimum. This is important, for the cost for repairs is too high in almost every mine in the United States.

Furthermore, by giving each machine the needed care there will be an increase in tonnage which will permit of a further saving in the cost of production. Many a mine manager feels that he would be glad to pay the repair and labor costs on his machinery if only there was no loss in the output of coal.

Perhaps the motor in one section of the mine which produces, say, 30 cars an hour breaks down. Only something trifling is wrong, but the work is delayed till the electrician has that something repaired. An hour or so is gone and that day's production is lowered 30 cars or more, for some of the men, tired of waiting, have gone home. If this happens several times a week or even once or twice a month, it means a lower average production and a higher average cost.

In order to lower the repair cost and increase the efficiency of the machinery, it is necessary to have a system simple but accurate, which will give an individual record of the performance and expense of each piece of machinery. In the first place, if there are a number of mines, a competent electrician with authority and ability to direct the operation of the machinery in accordance with the rules should be placed in charge of all the machinery of the company.

At a central point a repair shop and winding room fully equipped to do the repair work for all the mines should be located and also a supply house containing such repair parts as may be necessary. A competent man should be placed at each mine to take charge of all the machinery, and he should have assistance so that he can do his work properly. The wireman and bondman should receive their orders from him, and the motormen, pumpers, machine runners and all persons having the handling of any machinery should either be hired by him or sent to him for instructions before starting work.

He should have a place in which to do his work, fitted with bins and shelves for stock parts, and he should be provided with a pit and a crane to inspect and repair the locomotives. There should be another section in which he could repair pumps and machines.

Keep Machine's Tonnage, Time and Supply Bill

There should be a book kept at each mine by the electrician for the purpose of recording the working hours of each machine, and in this the hours idle should be marked down. With a little attention it will be possible to get the average number of tons or cars each machine is capable of producing, and thus it will be possible to find at the end of each month the number of tons lost through the inefficiency of any machine.

Each pumper and machine runner should turn in a slip each day, giving the actual working hours of each pump or machine and the time idle either by reason of accident or for lack of work. This gives an idea of the additional amount of work these machines can do.

Every night the motorman should fill out a report showing the make and number of his locomotive and the hours it has been delayed, and he should state any defects he may have noticed in its operation. The electrician should then have these defects repaired and sign the report and forward it to the chief electrician. The mine electrician should also fill out a daily report on this order:

Name of Company

Mine..... Date.....

Hours of Labor	Wage Rate	Make and Number of Machine or Locomotive	Repair Parts or Material Used	Cost of Part	State if Broken or Worn Out and Cause
3	25	SS No. 1620 Mining	1 worm gear,	$14.50	Broken teeth, worn
2	40	machine	1 key ¼x¼x6 in.	.06	too thin to stand strain
6	40	Inspecting pumps Nos. 1216, 1218	1 roll tape 2 sheets sand paper	.22	

Remarks: Advise that this machine be changed to easier work as the section is full of rolls and the machine is too light for that work.—S. G. Miller

This report should be sent daily to the chief electrician, who would check it against the motormen's reports and then he would have a form for each machine, locomotive or pump, and he would have each item charged against the machine on which it was used. Thus at the end of each month the exact cost of labor and material used on each machine could be easily found.

The wiremen and bondmen should report the section in which they have been working, the kind of work they did and the material used. This should be recorded,

and it could then be seen at a glance how much copper or other material was used to work out a section.

The mine electrician should at the end of each month send a report to the chief electrician, showing the horsepower, make and number of each motor, machine or pump at the mine, the number of hours in use, the amount of time out of commission for repairs and the amount of oil used on it. This, with the electrician's daily report, gives the chief electrician a chance to get down to facts.

Demonstrating Clearly the Why of the Record

For example, if a certain mining machine gives much trouble, he can see at a glance just what part was at fault each time, and with these facts on hand he can proceed to investigate and remedy the trouble. Again, if a certain part wears out on each machine of a kind, he will know that it is a weak part in the construction of that machine, and he can take it up with the manufacturer who will probably be able to suggest some way to overcome it.

The mine electrician should order his supplies once a month, and they should be charged against him and not against the repair cost until they are actually used and charged on his report. At the end of each month he should take an inventory of all the supplies he has at the mine and should be credited with them.

For example, he has $500 worth of supplies on hand on the first of the month, and his requisition shows that he has received other supplies worth $500. At the end of the month, on taking his inventory he finds he has $400 worth left. This shows he has used $600 worth of material. On checking up his daily reports they should balance with this figure to show that everything had been charged in its proper place.

The mine foreman should mark the delays to the machinery on his report also, and this should check with the mine electrician's and efforts should be made to keep them correct.

Each piece of machinery should be treated as a workman. The time in use, the amount lost, tons of coal handled or cut, cost of labor and supplies should all be completely recorded. This will show which is the most efficient machinery to buy for future use and which to discard, what parts wear longest and what parts are most liable to give out first. It also shows the amount of material, such as wire and hangers, bonds, etc., in each section of the mine.

Best Mechanics Engaged for Worst Machinery

In order to get results from this system it is necessary to have skilled and competent mechanics. One cannot reduce costs if the men fail to do their share. I have often noticed that most companies using first-class machinery have inexperienced and underpaid mechanics tending their expensive equipment, while companies having a poor grade of machinery have good mechanics.

Many coal companies will buy an expensive piece of machinery and then let an inexperienced man experiment with it. The result is the repair cost is large for the first few years, though it ought to be practically negligible. There is nothing gained by letting someone experiment with your machinery, and it is a costly practice. Through ignorance, most of such high repair costs are blamed on the equipment, whereas, if the machinery had been used in the right place and treated as it should have been, there would have been no trouble.

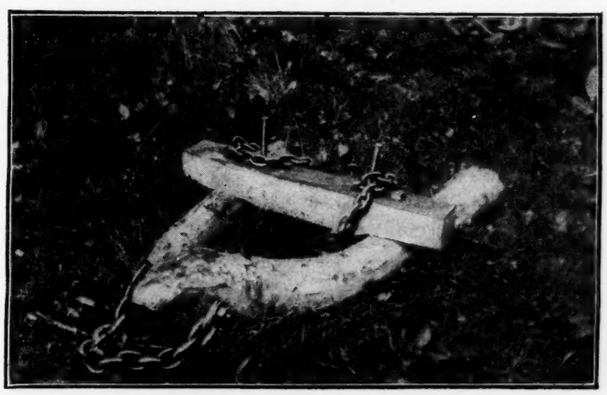
The average cost of repairs per ton of coal mined is about 10c. while, with careful attention on the part of the chief electrician and the mine electricians, it would be an easy matter to bring it down to 5c. per ton, and I believe if all did their best, it could easily be brought to less than 3c. with no interruptions to service during working hours.

Shoe for Hauling Rail Pipe or Mine Timbers

By R. S. Bonsib*

We recently had occasion to haul several hundred feet of 3-in. iron pipe down a rocky mountain side. This was a difficult operation until the little device, shown in the accompanying illustration, was installed.

The shoe was made of a forked locust trunk, peeled, and the large end cut down to allow the passage of a 12x⅝-in. bolt. A piece of 4x4-in. oak lumber, about



SHOE FOR HAULING PIPE OR TIMBERS

2½ ft. long, was fastened to the fork by means of ½-in. drift bolts, to which were attached two ⅝-in. iron rods, about 8 in. long, which served as attachments for the chain. The threaded end of the pipe was fastened to the shoe by means of a chain, leaving the end with the sleeve to drag.

This shoe cost about $1.18 and nearly tripled the amount of pipe handled during the course of a day. It is now being used with the greatest success for hauling out props and other mine timbers.—*Engineering and Mining Journal.*

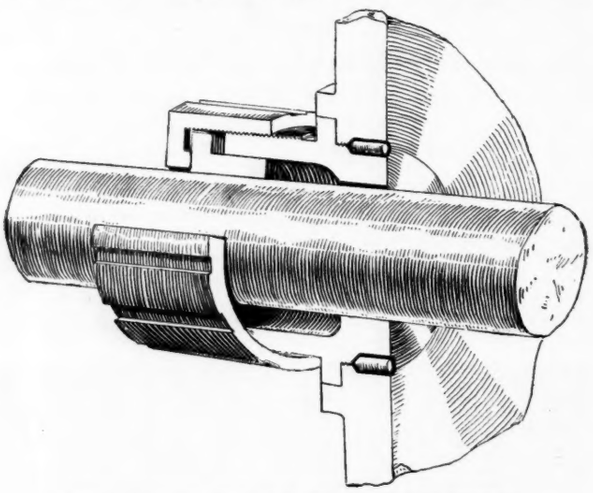
The Disastrous Mine Fire at Butte, Mont., elicited the following comment in "The Anode," the official publication of the Anaconda Copper Mining Co.: "Since the beginning of time, every age and every people have endeavored to perpetuate the inspiring memory of valorous deeds performed on the field of battle. From the very dawn of civilization the literature of the world has abounded with song and story depicting in burning words the heroic exploits of soldier and sailor; generations of children yet unborn will thrill at the tales of Drake and Nelson and John Paul Jones, and of Napoleon, Grant and Lee. Yet who shall say that the warriors of ancient or modern times are better entitled to be enshrined in the hearts of the people than the heroes of peace; than the men in obscure places, without the incentive of undying fame, who lay on the altar of humanity all that mortals can sacrifice—their lives. And who shall say, despite the terrible disaster and loss of life at the Pennsylvania mine, that the world is not richer and better by reason of the numberless unreckoning acts of heroism performed by the men in their attempts to rescue comrades in the stygian depths?"

*Mining Engineer, Low Moor, Va.

Key for Stuffing-Box Body

Small stuffing-boxes that screw into the cylinder are made secure by many different methods. Some are fastened by riveting, but it is difficult to get them out if necessary, says F. W. Bentley in *Power*.

The illustration shows a quick and simple way of securing the box, and there is no danger of the key getting out into the clearance space between the piston and the head.



PINS PREVENT BODY FROM UNSCREWING

The keyhole is drilled, as is customary, half in the box and half in the metal of the head. A pin or key driven in is of such a size that it is a firm driving fit in the hole, but it is of such a length that it can be driven with a punch about $\frac{1}{16}$ in. below the surface of the box and head. This permits a good portion of the two to be peened over, partly closing the hole at the end of the pin to hold it firmly in place.

I have set boxes in this manner in many stationary and portable air compressors, of which service records were carefully kept, and not a single case of a loose box is registered against this manner of locking them in place.

Disseminating Education on Safety

By J. F. K. Brown*

I often wonder why it is that more of our larger coal companies do not take up the "welfare magazine" idea and adapt it to their particular needs, requirements and problems. We are all much interested in two comparatively recently introduced movements in mining life—"safety first" and "efficiency engineering." The aim of the former is to introduce means toward saving and conserving human life. That of the other is conserving time and material.

Neither program can be or ever will be great unless the active interest of both miners and operators is gained and held; otherwise, these movements fall naturally back into the position of becoming part of the management's work and the equal, as far as general interest is concerned, of the slogan, "Reduce the costs." The successful evolution of these two movements is therefore largely educational.

The interest of the operators is readily gained because they read and can get material to show them the whys and the wherefores of efficiency and safety. Thus they understand there is something to be gained. But with the miner it is different. Our technical publications do not appeal to him; they are of no interest on general lines. His horizon is much more limited.

Any large company employing 6,000 people and upward possesses in that body of men a huge potentiality toward those two ideals, safety and efficiency, provided their attention is turned that way, and the measure of success attained is largely dependent on the degree of connection between the management and the men. With a large concern the intimate connection needed cannot possibly be attempted by personal touch, and effort has therefore to be transmitted through the medium of servants of the corporation, a method which, owing to differences in human nature, cannot help but be unequal, uncertain and much slower in its results.

Suppose, however, that the men responsible for safety and efficiency work and management were to combine and to publish, say once a month, a small leaflet consisting of a few sheets, to be handed to the men on paydays. Such a sheet would help materially to bridge the gap between a company and its operatives and, if properly conducted, could be made to have considerable educational effect, particularly along lines of safety, sanity and efficiency.

In it the successes and failures, the efforts in any particular mine or district of the company, could be briefly featured, giving the names of those responsible, since these names are more or less known to the workers, who will consequently be interested. Attention could also be drawn to what has been done in other fields and by neighboring companies. Again, now and then a direct word from the management to the men would prove of interest and be authoritative and satisfactory reading, leading to a feeling of knowing the man personally. Such a "leading article" would have praise for a particular section that had distinguished itself, or blame in an impartial way for another that had failed.

Still further, such a sheet could be utilized to obtain the ideas of the men themselves. Who can doubt but that there is in any large body of working men the possibility of getting many interesting and instructive suggestions? If this were not within reason, we would never see a mine manager rise from the ranks.

Doubtless the higher management of a company would be glad to have these suggestions, but the men are afraid to offer them and the petty officials do not as a rule encourage such suggestions, deeming the making of fresh proposals and improvements one of their prerogatives.

The idea is of course capable of considerable expansion, but before concluding there is one effect well worth mentioning, and that is, the power such a company paper would wield in making good the "pull-together shoulder-to-shoulder" policy, as against the department against department, mine against mine, that so often exists today, just for want of a common interest, a little plain speaking, and a little explanation.

Those who have worked in the lower ranks of a large company will well know the jealousies and heartburnings over promotions, the petty squabbles, the grabbing of other men's ideas, the malicious and false gossip circulated, the want of authentic answers to a few simple questions why, that exist there. And all this helps to give rise to a feeling of "don't care, because what does the company care anyway?"

*Sydney, N. S., Canada.

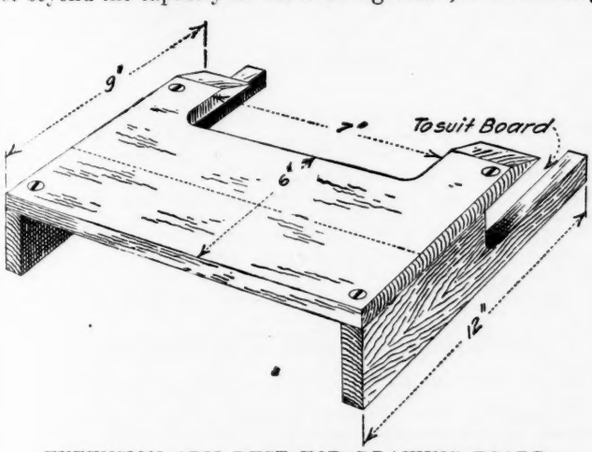
How much more satisfying and encouraging for John Jones to learn authoritatively through this paper that his rival, Paul Simpson, was promoted for good work in district No. 12 (detailed) rather than to be left to imagine that Simpson was promoted because of favoritism, or because he bought a place for himself, or because his wife's cousin is the manager's grand-aunt, or some other tale circulated at the time and believed in heartily, because there is neither contradiction nor simple statement vouchsafed for the real reason.

That there exists such an undercurrent of discontent on account of these and similar causes and that it breeds inefficiency and carelessness is self-evident in many concerns.

Arm Rest for Drawing Board

By R. G. Dickens

Having seen a number of suggestions for arm rests and drawing-table extensions for use when doing work up to or beyond the capacity of the drawing board, I am sending



EXTENSION ARM REST FOR DRAWING BOARD

another one. It is interchangeable on every table, so that only a few are needed to accommodate the entire force.—*American Machinist.*

Recollections of a Manager

[The series of articles known as "Extracts from a Superintendent's Diary" has been running in *Coal Age* for several years. They have been read by mining men in all fields and unless we misjudge the spirit and sense of the letters from readers that have come to us from time to time, this weekly contribution has been much appreciated and was regarded as a valuable column of our paper. Last week we printed the concluding article in the series. However, here is a brand new contribution that will run for a number of weeks and we hope you will find the "Recollections of a Manager," as interesting as you did the "Superintendent's Diary."—Editor.]

In the natural course of human events Mr. Scott, our manager, died, and some one of necessity had to be appointed to take his place. My advancement to succeed him was hardly to be expected, as several of the other superintendents had seen longer service with the company and to my certain knowledge at least three of them had always out-ranked me in favor with our board of directors. Nevertheless, this same board of directors, regularly assembled, two weeks after Mr. Scott's death, gave me the appointment.

Just after I received the telegram announcing my advancement (it was about 10:30 a.m.), I hurried over to the house to inform Mrs. Thompson that I was no longer a superintendent. "I expected it," she replied, "Mr. Scott has been so partial to you of late that all of the superintendents are jealous, and I just knew that no matter which one of them was appointed manager you would be asked to resign."

Now here was an opportunity to have a little fun at my wife's expense that I could not let pass, especially since it was not premeditated, so I assumed a most solemn expression and nodded assent.

"But don't let it worry you, dearest, it will be the making of you. Now you can plunge into authorship in earnest, and it won't be long before you will be classed with the immortals," she continued. "Nothing to do but write, and how you can write."

It was my turn to be surprised. True, I had written several sketches, picturing life around the mines, that had been accepted by one of the popular weeklies, but it had never occurred to me that my wife, or any one else for that matter, had taken them seriously; at any rate not seriously enough to build hopes on for future greatness. Then I suddenly recalled that only recently my wife had been reading a French novel in which the heroine was always pining for a lover who had already won a place in the "Academy" by his writings. The heroine had a husband, but he was a butcher or a doctor or somebody quite as unromantic. At any rate, I began to wonder just how much of an impression the novel had really made upon Mrs. Thompson, and whether it would now be possible for her to come back to earth and be satisfied with a husband who insisted on sticking to the coal-mining game.

Suddenly I received an inspiration. "Dearest," I said, "the coal-mining business needs managers who can express themselves well enough on paper to hold the attention of the general public and, while they have the attention, correct some of the false impressions that seem to have been so generally accepted. It can't be accomplished in a day, nor in many days, but it can be accomplished if the right kind of men undertake the task. Can you think of a worthier aim for my pen just now, or one that I could have nearer to my heart?"

I must have overdone the matter, because my wife was quite overcome by my earnestness and seemed to think that I might be arousing my hopes above possible fulfillment. As if to undo her part in the tragedy she quickly made some remarks about "pull" and "blind directors," and the hopelessness of expecting such men to pick the best man when it came to choosing managers.

"That's what I came over to tell you, foolish one," I replied.

Crush and Upheaval naturally increase with depth in mines. To certain depths, varying with the degree of hardness, the increase may generally be moderated by increasing the proportion of pillar in room-and-pillar work, and in all kinds of work by varying the direction of the mining. Soft seams of coal with slippery faces begin to crush in narrow openings at a depth of about 1,500 ft., and in some instances both in narrow and wide work, large outbursts of crushed coal occur suddenly from the unworked seam beyond. Such outbursts are often accompanied by firedamp and may often be avoided by boring in advance or in the roof or floor.

Anthracite Price Investigation

The Pennsylvania Legislative Commission to inquire into the retail cost of anthracite coal, as affected by the imposition of the state tax, has arranged to hold a meeting on Sept. 7 in the City Hall, Philadelphia, to take testimony. It will be recalled that early in the summer the commission endeavored to simplify its work by mailing a series of questions to all retailers in which they asked them to give detailed statistics as to the cost and selling price of anthracite, together with the amounts purchased, prior to the enforcement of the act and after its imposition. As practically few dealers were willing to lay bare their entire business in this manner, the commission received very few replies. Now they have arranged to take testimony as above outlined, and in pursuance of this object they have this week sent letters to about fifteen of the largest dealers in the city, asking them to appear as volunteer witnesses at this meeting. While this letter is most courteous, yet the recipients are informed that unless they signify their intention to appear voluntarily they will be subpœnaed, which power the commission possesses.

The retail men have insisted all along that they have not the least objection to testifying as to the cost of anthracite fuel and are even anxious to let the public know on what a small margin they are doing business, when it is considered that the retail yards are really idle from four to five months in every year.

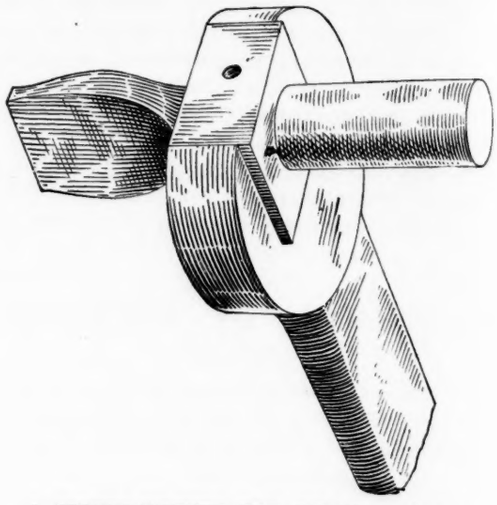
This information the commission has thus far shown no disposition to bring out, but it is altogether likely that it will be adduced at the public hearing set for the 7th inst.

With the idea that the retailers shall be properly represented the Philadelphia Coal Exchange, to which most of the dealers belong, have taken action and employed eminent counsel in the person of John G. Johnson, who will also be assisted by Wellington M. Bertolet, secretary of the Pennsylvania Retail Coal Merchants' Association, who has made a careful study of the situation.

In addition to this public investigation the dealers this week became cognizant of still another effort along the same line and which on its face seems to have a fairer motive. On the stationery of the University of Pennsylvania each retail coal man received a communication signed by E. S. Mead, in which he said that they were endeavoring to prepare a statement for presentation to the Legislative Commission at its meeting in September, covering the question of the cost of the retail distribution of coal, saying that it is their endeavor "to determine, in order to explain why the cost of retail distribution is so high, how much of the capacity of your yard and equipment, taking the whole year through, is not utilized. In other words, how many tons of coal could you put over the amount which you are distributing if your facilities were fully employed? The public have an altogether erroneous idea of the high profits of retail coal distribution and it is hoped by those interested in this investigation that a statement may be made which will place this matter in its proper light." As this is identically the view of the average retailer it is really hoped that this latter investigation may be productive of good. In the meantime the results of the investigations will be awaited by all coal-mining men with more than ordinary interest.

A Screw-Driver for Heavy Work

When forcing home large screws in dies where cap-screws cannot be used, it is necessary to have leverage on



A SCREW-DRIVER FOR HEAVY WORK

the screw-driver in order that the screws may be driven tightly, says G. Walter, of Newark, N. J., in a recent issue of the *American Machinist*.

One of the best methods of obtaining this leverage is to shrink-fit and pin a square nut on the shank of the screw-driver, as shown, and apply a wrench.

Recent Legal Decisions

Employee's Contributory Negligence in Blasting Operations—A coal-mining company is not liable for injury to an employee while engaged in blasting operations, when the accident is directly attributable to the injured man's own carelessness in overcharging a blast, and in failing to resort to available shelter, in violation of previous instructions and warnings. (Michigan Supreme Court, Gatewood vs. Consolidated Coal Co., 158 Northwestern Reporter, 833.)

Maryland Relief Fund Law Valid—The Maryland law which provides for a miners' relief fund, to be constituted by assessments against both employer and employed, is a valid exercise of the state's police power to provide for the relief of dependent persons, and is not unconstitutional because limited to particular occupations and to two counties —Garrett and Allegany. (Maryland Court of Appeals, American Coal Co. vs. Allegany County Commissioners, 98 Atlantic Reporter, 143.)

Responsibility of Employer for Negligence of Physician—When an employer derives no profit from an arrangement whereby he deducts a stated amount from his employees' wages for the purpose of retaining a physician to attend them and their families in case of accident or illness, he is not liable for any negligence or unskillfulness on the part of the physician, unless he has failed to use due care to retain a reasonably careful and competent physician. (Mississippi Supreme Court, Eastman, Gardiner & Co. vs. Permenter, 72 Southern Reporter, 234.)

Reservation of Coal in Lease—Under a grant to a coal-mining company to remove all coal under a tract of land, reserving to the landowner the "right to retain three acres in one body underneath the buildings now erected on the land, if desired, said three acres to be located" by him, there is no absolute reservation of three acres of coal under the buildings, and if he gives no notice of location and accepts royalties on coal mined under the buildings he will not be permitted afterward to claim damages for removal of coal or occupation of the land under the buildings. (Pennsylvania Superior Court, Clark vs. Armstrong County Coal Co., 61 Pennsylvania Superior Court Reports, 521.)

The Labor Situation

General Labor Review

The strike of the union men in the Northumberland County district of the anthracite region to compel all the mine workers employed in that section to join the union failed under its own weight. The employees never expected it to last as it did for 11 days. The union has "gone easy" all through the affair, adjudging that to suspend so many violators of the contract would be suicidal.

The organization was not sorry to see so much enthusiasm in the promotion of its success and was not unwilling to welcome the new members it was gaining. Other scattering strikes occurred throughout the anthracite region.

In Somerset County, Pennsylvania, Judge Ruppel made permanent an injunction restraining union mine workers in Hooversville from intimidating the men who were working.

In the Hocking district of Ohio the union has revoked the charter of a local which followed a strike on the powder issue by another to get a mine foreman discharged. The miners at a small mine at Murray City in Hocking County have been complaining about the increase in the price of powder from $1.65 to $1.90. The men went on strike for a week before they returned to work. Apparently the price of powder was not restored to the original level.

In eastern Ohio there has been a strike at the Custer mine of the Hutson Coal Co., near Hopedale, in Harrison County. The Warwick mine, the largest in Coshocton County, where the mines are indeed all small, is on strike to force the operators to pay more for the removal of such drawslate as comes down without the miner being able to prevent it. About 120 men have quit work.

In West Virginia there has been an attempt to induce the miners in the flooded district to leave for other kinds of work in other states. Jack H. Nightingale, the state labor commissioner, has been endeavoring by argument to prevent the men from leaving. Some of the miners have gone to the Fairmont region, where their presence is quite acceptable owing to the prevailing labor shortage.

The Central Coal and Coke Co. has a strike at Huntington, Ark., the men at Mines 2 and 3 having quit work in violation of the orders of the board members of the organization and President Wilkinson, of the United Mine Workers of America. This strike is about payment for room-turning. The Hartford men of the same company have also come out.

On Aug. 23 the joint subscale committee of the Southwestern Interstate Coal Operators' Association declared that no agreement could be secured, the difficulty being largely in regard to the right of the employer to discharge men for violations of the company's rules and State mining laws.

The Colorado Fuel and Iron Co. has raised the wages of its miners 3c. per ton, or from 55 to 58c.—apparently the full "McAlpin" wage increase. Other mineworkers of the company are also to receive an advance.

Lengthy Button Strike Ends

When about 16,000 mine workers of the Philadelphia & Reading Coal and Iron Co. and the Susquehanna Coal Co. went on strike in the Northumberland County section on Aug. 17, it was expected that the suspension would be short. But the nonunion men and the men who refused to pay their dues were strong in their determination not to be coerced. The strike lasted 11 days, a longer vacation than most of the men meditated taking or were willing to take. Even then the 100-per cent. union—the ideal of the unionist—was not attained.

On Aug. 20, after the United Mine Workers' general committee had failed to induce the men to go back to work as their contract required, a special meeting was held at Kulpmont. It was found that there were 62 nonunion men employed by the Philadelphia & Reading Coal and Iron Co. between Locust Gap and Trevorton and 400 by the Susquehanna Coal Co.

The larger part of the latter were engaged at the Cameron colliery and the mine workers decided to remain idle till all the men in this and other collieries were fully unionized. In many workings every man employed was a union man. It was stated that the Cameron colliery had not worked so well as others in the last six months, and some of the workmen excused their failure to pay dues by saying that they had scarcely earned enough to clothe and feed their families and could not afford to make payments to the union.

On Aug. 21 the Richards colliery, near Green Ridge, a Susquehanna Coal Co. plant, resumed operation after being idle four days. It was reported that two or three employees at this mine had not affiliated with the union, but as they had promised to pay their dues after the next pay day the other employees decided to return to work. On Aug. 21 there were still 368 nonunion men at the mines of the Susquehanna.

On Aug. 22, owing to the labor trouble, fully 200 men left the anthracite region. Agents of the munitions plants in Delaware, New Jersey and Michigan had been busily seeking recruits, relying on the idleness and disaffection to enable them to secure men.

On Aug. 24 the miners again had a meeting and decided to continue on strike. However, the Alaska and Reliance collieries of the Philadelphia & Reading Coal and Iron Co. and the Richards and Pennsylvania collieries of the Susquehanna were running. The mine workers, however, promised to get them out on strike again on the following day.

Went Back to Work with Many Nonunion Men

But the strike was lasting too long to be a rest or a holiday and when the general committee met at Kulpmont on Aug. 27 they were not so keen to wait till the last man was brought back into the fold. They found there were a few men still nonunionized—how many they apparently did not say. It was a fact, they declared, that there were so few who would not enter the union that the unionization was practically complete and that the work of the organization would no longer be jeopardized by the presence of nonunion men.

So finally on Aug. 28 the men and boys of 14 collieries, all those which were still on strike, went back to work. The return to labor may have been hastened by the declared intention of the Susquehanna Coal Co. that it would bring the men before the bar of the Anthracite Conciliation Board with District No. 9 and the international organization as defendants. The company intended to ask that damages be assessed for the injury done it by the enforced idleness.

It was expected that following the decision in the Danbury Hatters' case, in which members of the union who owned property were held liable for damage done to the company, the mine workers who had struck entirely without cause or shadow of justification, and who in doing so had violated a solemn contract, could be made to pay just as any other person may be made to pay who agrees to do something for a consideration and then fails to comply with his contract.

The stand of the company could not but look entirely reasonable even to the mine workers. All the notions that laboring men are superior to contracts and are in fact an imperium in imperio, vanish in court. Mine workers are just common folk before the judge and are required to keep their agreements like other men, are subject to the call to do right and are not permitted to ride roughshod over their obligations.

Hard Coal Men Break Contract

Looking at the week's news one is compelled to wonder why the mine workers ever made a contract or approved of a conciliation board. For they violate their contract with or without a grievance against the employers, and when they have a grievance they want to rearrange matters by a strike and not through the conciliation board.

On Aug. 24, 800 employees went on strike at the Lehigh Coal and Navigation Co.'s No. 10 colliery, throwing that operation idle. There had been a heavy flood and much damage had been done. Twenty-five contract miners had been called upon to make repairs, and the men were dissatisfied as they could make more money as contract miners.

On the same date 700 men went on strike at the No. 9 colliery of the Lehigh and Wilkes-Barre Coal Co. at Sugar Notch because 20 men had neglected to pay their union dues.

An effort was made to compel everyone in and about the colliery to join the union regardless of their preferences.

At the Mineral Spring colliery of the Lehigh Valley Coal Co. at Parsons, the contract miners have been demanding 10c. a foot for setting props. About 120 contract miners, disregarding the ruling of the officials of the United Mine Workers, which called on them to work while their grievance was adjusted, went on strike and about 600 men and boys were compelled to lay idle.

At the Greenwood colliery of the Hudson Coal Co., Rendham, Penn., the men complained that their wages were less than at any colliery of the company and that the officials in the past had allowed the daymen an extra number of shifts so that they could make a fair monthly pay. The men stated that this arrangement had recently been discontinued. They also objected to the variation in the schedule of wages and stated that there were 16 different wage rates among the drivers alone. To change these alleged conditions the 900 men employed went on strike, but were induced to go back to work on Aug. 26 after a meeting held with the members of the miners' local advisory board.

Ruppel Injunction Permanent

The injunction of Judge Ruppel, forbidding the mine workers at Hooversville, Somerset County, Pennsylvania, from interfering with the men who were at work at the mines of that place has been made permanent. At the hearing the operators' witnesses declared that their men were in deadly fear of night attacks. The mine workers replied that no parades had been held during the night and that the strikers made no demonstrations after dark.

They denied having used the word "scab" in reference to any mine worker, though they admitted singing a song containing the words "Don't be a scab." On the other hand, the mine workers declared the company's guards had invited them to go to h— when a band of strikers passed an automobile full of guards on the public road and an altercation arose as to the room which each should occupy.

The operators objected to the newspaper advertising of the union, in which mine workers were asked not to go to Hooversville and not to work for the companies till the strike was settled. It was alleged by operators that the mine workers carried guns, and in the reply the latter admitted they did. They said that they borrowed a flag from the Patriotic Order of Sons of America, and that a rule of the order required this flag to be protected by color guards with empty guns. For this reason two strikers marched on each side of the flag with a gun.

On all other occasions the color guards were members of the patriotic order named. Now if only a red-blooded patriotic order could be found that would require a company of color guards with loaded rifles to honor the flag, what a convenient order it would be when a parade was planned to intimidate some unruly nonunionists.

The mine workers reported last week as being on strike are still idle, and the companies whose operations are hampered by the union are gaining ground. The concerns which have been seeking the protection of the court are the Baker-Whiteley Coal Co., the Wilbur Mining Co., the Somerset Mining Co. and the Knickerbocker Smokeless Coal Co.

Southwest Conferees Deadlock

The subcommittee of miners and operators at Kansas City, consisting of Messrs. Howat and Diamond representing the miner workers, and Fleming and Jordan representing the operators, reached a disagreement on Aug. 22. The barrier in their path to accord is Section 4, providing methods for hiring and discharging, the miners' representatives refusing to recede from the position that a man cannot be discharged for any cause, including offences in violation of the company's rules or in violation of the mining laws.

The operators' representatives reasserted this to be their privilege, while the miners declared that it should be used under restrictions. On Aug. 23 they reported a disagreement to the joint conference, and the outcome was uncertain. It was thought in some quarters that in case the joint conference broke up, the operators of Oklahoma and Arkansas would attempt to make their own state contracts with the miners.

There is still hope left in the promise made by the International office at Indianapolis that they will not tolerate a suspension. It is thought that the rank and file of workmen in Oklahoma and a majority of those in Missouri feel that the position of President Alexander Howat, of the Kansas miners, with respect to this clause is not tenable, and have so expressed themselves. Unless the Kansas operators agree to Howat's contention a strike may occur at the mines of that state. The operators of the other three states are said to be standing unitedly for nothing more or less than what the New York agreement expressly provides and will allow no further changes to be made.

On Aug. 23 W. L. H. Johnson, general commissioner for the Southwestern Interstate Coal Operators' Association, addressed to that body the following letter:

As was stated in my circular of July 22, it was agreed that an advance of 3c. per ton should be paid on mine-run coal extracted by solid-shooting or machine-mining, and 5c. per ton on pick-mined coal, where the same has been paid in previous settlements under the Cincinnati and Cleveland agreements and where the same method of mining is continued. It was also understood that on all day labor, dead work and yardage and room-turning an advance of 5 per cent. on existing prices should be paid. In return for the mine workers contracting to continue at work pending negotiations it was agreed that the above advances should be effective Aug. 1 and made payable on the first half of the August payroll. Where there are divisions of the advance between the loader and machine crew no definite settlement has been made that can cover all cases; therefore, each operator must determine this division with his district officers or local, or make arbitrary division based upon existing percentages.

The subcommittee on the interstate agreement has disagreed on Sections 3, 4, 6, 7, 12 and 19 and has so reported to the general conference today, and a recess was taken for the operators to confer together and another subcommittee may be appointed to confer again on the disputed sections, as it seems the best policy to continue negotiations as long as there appears an opportunity to get a satisfactory settlement.

At the close of the month the subcommittee was still in session at Kansas City, wrestling with the question of the rights of applicants to appeal under Sec. 1 for employment or limited compensation. As the operators' representatives refuse to change the wording and purport of six sections in the old contract a disagreement and a report to the general conference of inability to agree was expected on Sept. 1.

Another Union Disciplined

President John P. White has expelled another local union for going on strike contrary to the contract and the orders of the union. The 175 mine workers at mine No. 37 of the New York Coal Co. at Bechtel, Ohio, went on strike to compel the discharge of John Murphy who was engaged as mine foreman at that plant. The mine workers were informed of the intended action of the union officials on Aug. 23 and on the day following the whole union was expelled.

There are 500 mine workers who have struck in sympathy and they are still on strike. Doubtless similar drastic action will be taken in respect to them. Only one mine of the New York Coal Co. on the Toledo and Ohio Central Ry. side of the valley was in operation last week. The men at the mines of the Sunday Creek Coal Co., the New Pittsburgh Coal Co. and the Poston Consolidated Coal Co. have refused to join the strike.

It is a pity the union seems able to squelch illegitimate strikes only when they are small. There is room for some such chastisement of contract breakers in the anthracite region. The mine workers are getting out of hand entirely too often and are willing to be bound to neither their word nor the union.

Connellsville Desires Better Coal Freight Rates

Connellsville has for a number of years been utterly indifferent to the freight rates for coal. The citizens of the region hoped that the transportation charges would always remain so high that the limited amount of coal found in the beds of the region would almost all be converted into coke in the ovens of the district before being transported. This coking employed many men and the product made the section famous.

Recently, however, Connellsville coke has lost its strong hold on the market. Byproduct coke which at first was considered inferior has now proved even better than the best beehive coke. It is certainly a more profitable product than the beehive variety, for there is more of it per ton of raw coal used; and there are many byproducts formed which have a ready market, not to mention tar, which sells with some difficulty. These plants are all out of the Connellsville region and as they are economical they will operate when the Connellsville ovens are idle.

So other centers are threatening to rival Connellsville and close its plants down, and the Connellsville citizens and

A, -15¢ Rate Districts in this Zone Groups 1 and 2

B, -10¢ Rate District

C, -5¢ Rate District

D, -5¢ Rate District Group 2 = Group 1 + 10¢ to Points East of Toledo

E, 0 Rate District in this Zone

F, 0 Rate District

FIG. 1. COAL-FREIGHT DISTRICTS FOR POINTS WEST OVER PENNSYLVANIA R.R.

coal producers are looking askance at the high freights which they are required to pay and they have recently made a protest to the Interstate Commerce Commission accompanied by elaborate tables, plans and charts showing that their coke business was not growing; that the new plants erected were being constructed elsewhere than in the Connellsville region; that byproduct coking was taking the place of beehive coking, and that freight rates were higher from the Connellsville region than from all competitive points.

The Connellsville interests, in order to present their case, have formed the Connellsville Coal Tariff Association and have engaged C. Andrade, Jr., of 52 Vanderbilt Ave., New York City, to act as attorney, and J. P. Muller, accountant for Marwick, Mitchell, Pease & Co., to prepare the exhibits.

From the plans thus filed two, relating to the Pennsylvania R.R., have been taken and redrawn, omitting some matters and adding some others. Fig. 1 shows the relation of the rates from various points to the West and Fig. 2 the relation similarly to points in the East.

How Connellsville Fares in Western Trade

The Connellsville rate, in the map above, Fig. 1, which applies to the whole area E—from Fairmont, W. Va., northward—is the highest of which figures are given for traffic west. Such districts, of course, should be excepted as make no pretensions of entering Western trade, except by way of the Great Lakes. There is a district in Indiana County that reaches down into Westmoreland County, marked F, which has a similar rating. All the other districts are rated from 5 to 15c. lower. A small district D, which the original map calls Group 2 and which is located near Brownsville, has a 5c. differential in its favor over the Connellsville rate to points east of Toledo. The mines included in this area are those of the American Zinc and Chemical Co. at Langeloth, Atlas Coal Co. at Atlas, Avella Coal Co. at Penobscot, Charles W. Braznell at Maple Glen, Clyde Coal Co. at Clyde, Fredericktown Coal and Coke Co. at Fredericktown and the Ten Mile Coke Co. at Besco.

There is a similar differential of 5c. in favor of the area marked C, which includes much of the Latrobe district and the area around Blairsville. A 10c. differential rules as regard the lower Kiskiminetas River district and the mines along the road from Butler to Freeport—the area marked B.

A 15c. differential exists in favor of Groups 1 and 2 as named on the original map, here marked A and D. This area is quite large and includes the Panhandle steam-coal district, the Westmoreland-Irwin gas-coal district and most of the Greensburg district. As already stated, the differential is only 5c. in favor of shipments which go east of Toledo from the area marked D on the map here given and Group 2 on the map presented to the Interstate Commerce Commission.

It will be seen therefore that the Connellsville region pays on the Pennsylvania R.R. a rate equal with the highest on its Western traffic. The maps show nothing regarding the rates west from points east of area F or from mines in the Meyersdale-Somerset district.

Connellsville Pays Leading Coal Rate East

It will be noted that on the map of freight-rate areas, which refers to the Eastern business, the Connellsville district is grouped with a large area that has been marked L. It includes the Lower Connellsville district or Klondyke (which is marked in the map as L. C. Dist. Klon.), most of the Panhandle steam-coal district near Pittsburgh, part of the Westmoreland-Irwin gas-coal district, the Allegheny Valley mines up to and beyond the Red Bank Creek and all the mines on the Sligo branch. It also includes all the Monongahela Valley down to Fairmont, W. Va., not hitherto included in the descriptions of other areas. This whole area has been described as the Pittsburgh-Aladdin-Lawsonham area.

The northern part of the Westmoreland-Irwin gas-coal district K (dubbed the Westmoreland area) and the district between Lawsonham and Fuller on the Red Bank Creek (Low-Grade Division of the Pennsylvania R.R.), known on the map as the Fairmount section, have rates 15c. more favorable; and to a certain extent they deserve the greater consideration as they are, on the whole, nearer the market than the Pittsburgh-Aladdin-Lawsonham area though there are obvious exceptions.

The Greensburg district, I, has a rate still better, 30c. less than the Connellsville district and 15c. less than the Fairmount and Westmoreland districts of Pennsylvania. So also has the district east of Fuller, known on the map as district

G, -40¢ Rate Districts in this Zone Latrobe-Clearfield

H, -30¢ Rate District in this Zone Reynoldsville

I, -30¢ Rate District in this Zone Greensburg

J, -15¢ Rate District in this Zone Fairmount

K, -15¢ Rate District in this Zone Westmoreland

L, 0 Rate Districts in this Zone Pittsburgh-Aladdin-Lawsonham

FIG. 2. HOW COAL FIELDS ARE DISTRICTED FOR SHIPMENTS EAST ON PENNSYLVANIA R. R.

H. It includes Reynoldsville and Du Bois. Lastly, the Latrobe-Clearfield district, G, has an advantage of 40c. over the Connellsville area.

It is clear from the foregoing that Connellsville has somewhat higher rates than her competitors, partly perhaps because the district is in a central position too far east for the Western trade and too far west for the Eastern trade. It has the disadvantages as well as the advantages of centrality.

Editorials

Articles on Safety and First-Aid

The Oct. 2 issue of *Coal Age* is the annual "Safety Number." We want every reader of the paper to send us an article covering some phase of safety or first-aid for publication in this special issue. If you have not already become a contributor to the editorial pages of *Coal Age,* start with an article in the Oct. 2 number. There is no subject pertaining to the operation of coal mines that is more popular today than the vital question of safety. Articles should be in our hands not later than Sept. 21. Wherever it is possible, photographs or drawings should accompany the contributions to illustrate the text. Every article published is paid for at a liberal rate. Help us make this year's "Safety Number" a veritable encyclopedia of information on the subject.

Handling Water Underground

For some reason or other the direct-acting, steam-driven duplex pump has always been a favorite for dewatering American mines. Just as the English coal industry has clung tenaciously to the type of pump that has steam cylinders on the surface and water barrels underground, the two being joined by connecting-rods, bell cranks, vertical pump rods extending several hundred feet down a shaft, then more bell cranks and connecting-rods, before the water plungers are finally reached, so the Americans have retained the "duplex" pump with its ravenous consumption of steam, long supply and exhaust lines, yet reliability withal.

In its very best and most efficient form, when compounded or built triple-expansion, this type of pump is still well nigh insatiable in its steam consumption. Forty pounds of steam per service horsepower-hour is about the best—that is, the least—consumption commercially obtainable. This is a little more than three times the steam consumption of a good steam engine or turbine operating under favorable conditions.

The article appearing on page 378, by H. S. Geismer, states that the cost of replacing a steam pumping equipment with an electrically driven one will be almost always paid for through the saving effected in a few months. This statement is often borne out in practice.

In the light of this fact it is surprising that greater attention has not been paid to the pumping problem by coal-mine officials. While it is doubtless true that the steam-actuated pump was at one time a machine with high commercial applicability, and that it still doubtless has in many instances economic application, yet one can hardly believe that the pumping systems now in use at many coal mines, with their long and wasteful steam lines, are the result of careful and well-directed engineering skill. In at least many instances they are doubtless the result of enlargement upon a small beginning. No plan was made in the start covering the ultimate development. Like Topsy they "just growed."

Is the Union Worth While?

Last week the general question was asked whether unionism as a whole had helped the workingman. The answer was in the negative, but it does not follow that the question, "Is the Union Worth While?" should be answered in a similar manner.

For example, if we should ask, Is war worth while? the answer with most of us would not be long in coming; and it would be in the negative, for it is not hard to show that the sum total of the gains and losses of war has been a loss and not a gain. Some few—very few—have won, multitudes have lost, but on the whole for all of us during peace and not during war are our periods of progress.

But the question is changed if we ask, Is an army worth while? Provided it is used for self-protection, an army is a most desirable part of the *ménage* of every country. We have to maintain armies because other people have them. In fact, as others have armies, we cannot do without one. Moreover, an army is a much needed institution if in an evil moment we seek to be aggressive and enlarge our place in the sun.

Now it has been shown that when a body of union men, shoemakers, let us say, obtain a rise in wage, other men, miners, for instance, pay more for what the shoemakers produce. So the miners who are thus made to pay more need a union to enforce conditions under which the first union men to obtain a rise—the shoemakers—shall pay back the advantage they have taken by paying more for what the miners produce. The first union has employed the organization as a means of aggression, the second union has used it for defense. Perhaps the first union received a rise of 10 per cent. and the second union is at a disadvantage until it has gained its 10 per cent. and so recovered its standing.

Now as a rule the people with unions get an advanced economic standing over nonunion men, who are quite apt to lag behind until there is a shortage of such craftsmen available, when at last slow-moving supply and demand does something for their welfare. The union helps to raise the wages of men in ununionized crafts because the men tend to drift into unionized employments and unionized areas where the pay is more liberal. But the union aids such men so slowly and indirectly that their income barely moves forward with that enhanced cost of living which results from labor agitation and wage increases.

Hence it is that unorganized men quite usually suffer. That is why mining engineers make such poor pay. Only a few years ago a college graduate at a Pittsburgh university, a bright fellow, the best in his class, was lamenting the fact that if he engaged as an engineer for a coal company he could get only $40 a month. That is why mine and firebosses are underpaid; and hence someone at a West Virginia mining institute condemned the concentration of all the teaching effort on mine foremen and firebosses, who when taught were given less pay than the average miner. For a similar reason the clerk, despite his education, often receives less pay than a roadman.

So unions have their value. They enable one group of craftsmen to make all the other groups pay them a larger wage. If they deserve it, well and good; but who shall determine that? Since that cannot be accurately determined, the best thing the union can do is to enable its own group to maintain its status in the labor world. This is the essential work of unionism.

Its right purpose is not to raise wages for one geographical section of a craft to such a degree that the men in that section cannot get steady work. It is not to battle for a rearrangement of freight rates which will lay several thousand men idle.

It is not to put barriers around men so that their production will be lessened and their labors made less useful to the world. It is not to disturb the balance of power so that the craftsmen in one trade receive twice the pay given those in another without any greater deserving and make the other craftsmen pay it. It is not to remove the profits of industry so as to cripple development and prevent the progress of invention and the introduction of labor-saving devices.

The union is necessary because unions are here, as armies are needed because we are cursed with armies. And sometimes unions are required to curb the arrogance of capital; but at least as often the power of the employer is needed to curb the arrogance of unions, and worse yet in the coal business to curb the unfair aggressions of union men, for the average labor leader in the coal business is generally far more reasonable and responsible than the dominating forces to be found in the locals. The indications are that the difference between them is due to the maturing influence of a contact with the labor problem and consequently there is every hope that the conscience of unionism will progress as the years go by.

A Change in Style

Our readers will probably be interested in knowing the reasons for the change in style adopted for the market and news departments of the paper, beginning with this issue. As will be noted, the old two-column page has been replaced by three columns, the widths of which are proportionately less.

Decreasing the width of the columns makes it possible to decrease the space between lines, which substantially increases the capacity of the page. Our readers will undoubtedly be surprised to know that the quantity of material run in these pages under the revised style will be approximately 35 per cent. greater than with the old two-column form. This is therefore equal to an increase of between three and four pages in these two departments.

A second determining factor was increasing the readability. At an international conference of printers held in Europe a number of years ago, the thirteen-pica column for six-point type was decided upon, after a long series of tests, as the one which the normal eye most readily carries through with a minimum effort. This is the column that has been adopted by all newspapers and has become the standard the world over. In the market department the three-column page also gives greater flexibility in the sizes of the numerous tables to be used.

It is needless to say that the change involves a substantial increase in the cost of these pages, not only from the additional material run, but also the cost of setting, which will amount to, roughly, 40 per cent. more.

Help That Precedes First Aid

As "first aid" is usually understood, it is that medical and surgical assistance which may legitimately precede the help furnished by professional men. It does not include that rescue work which in general must be accomplished before the first elementary medical and surgical aid can be provided.

At least, that is how *Coal Age* views it. Perhaps the word is entitled to the larger meaning given in the glossary of mining terms in the "Coal Miners' Pocket-Book": "The assistance or treatment which should be given an injured person immediately upon injury or as soon thereafter as possible."

In the issue of Aug. 19 a Kentucky correspondent urged instruction in this rescue work. Miners in some parts of the country are being instructed in it, and an instance has been noted in which a team went through the motions of sounding the roof before removing the man from an imaginary rock-fall. Unfortunately, in their unreasoned mimicry they tried the roof immediately over the victim, assuring him thereby of certain death should all the loose slate respond in the affirmative to their questioning prods.

Rescue should be studied, not only with relation to a mine fire or explosion, but in regard to the more frequent roof-fall. It is a fact that most victims in the mine are not found in their B.V.D.'s lying prone on their backs on a blanket with lots of air space and headroom around. As *Coal Age* has said, the men are frequently huddled up and more frequently fall face forward than face upward.

But the doctors who train us apparently cannot get away from the conditions in an operating room. Assume you have your patient on an operating table; how, they ask, would you go about the work of bandaging? It was because Dr. McHenry got away from assuming such a pose for the victim with a broken back that his work was so interesting.

Still more perplexing in the field is the diagnosis, which in a first-aid meet is already provided. If only when a man is hurt and covered with rock, someone would slip up with an envelope which, being opened revealed a typewritten statement of just what ills the victim had suffered, what prodigies of aid could we not render? Too often the bulk of the ills are discovered only after some grievous mishandling of the patient has intensified them, perhaps increased the agony of the spine, developed the compounding of the fracture, severed an artery and caused the victim to swoon.

How important then it is to instruct men in the necessity of using the right methods prior to bandaging and in the need for guarding against the evil effects of a diagnosis which is incomplete, as it almost always must be under the mining conditions. It may be said of first-aid men, as it is often remarked about doctors: "Dead men tell no tales"; and "The grave covers up all mistakes."

Errors in bandaging may be concealed, but the mistakes in the pre-bandage period are not to be detected. Yet it is probable they are more frequent and more important than mistakes in bandaging. If anything can be done to make this rescue technique more efficient, it should certainly be attempted, for what rescue man has not been filled with doubts when first facing a groaning victim?

Department of Human Interest

Flower Gardens in Panhandle

W. Francis Hyde, head of the Welfare Bureau of the Wheeling (W. Va.) Commercial Association, and Webster H. Sill, Brooke County agent of the Panhandle Agricultural Club, have joined forces to develop home gardening and flower culture in the vicinity of Wellsburg, W. Va.

The work in the Colliers mining section, in the north of Brooke County, is being carried on with the complete coöperation of the West Virginia-Pittsburgh Coal Co. The company recently offered three prizes, amounting in all to $125, which were won by Louis Carodi, Steve Streho and Fred Roach, the value of their gardens being in the order named. The judges were Webster H. Sill; W. S. Owens, of Colliers, and A. L. Carter, of Follansbee.

Miss Rose Dare, of Wellsburg, teacher of a rural school near that place, has a class of about forty young women in the Colliers section to whom she is teaching home beautifying, gardening, sewing and fruit-canning. Her work is being done under the direction of the Panhandle Agricultural Club. The girls, who are largely foreigners, are quick to learn under proper instruction.

Miners To Lease Orchard Land

U. S. Morris, the vice-president and general manager of the Superior Colliery Co., Wellston, Ohio, has offered to lease land for orchard purposes to the employees free of rental or taxes during the first three years. No definite plan has been prepared, as the following notice posted by the company clearly indicates:

We shall be pleased to take under consideration a proposition from our employees to lease land to them for orchard purposes, on condition that they organize a company for the purpose of making such a lease and operating an orchard. The offer is made solely with a view to benefiting our employees and in the hope that the project may be worked out along lines that will yield them an encouraging profit on their investment.

As much acreage as the proposed company can advantageously handle will be set off for the purpose, and no rental or taxes will be charged during the first three years.

The management suggests this procedure: That each mine appoint one or more of its employees to serve on an organization committee to consist of committeemen from all the mines; that this general committee prepare a proposition, and when so prepared, a conference be held with the general manager to arrange the details of the agreement. It is likely that some plan can be worked out by which a small sum can be checked off at each pay from the wages due those who would be unable to make a full payment for their stock at one time.

The Superior Colliery Co. is operating orchards, and it will give the proposed company the benefit of its experience and contribute in other ways to make the plan a success.

Lathrop Mining Institute

At a meeting held on Aug. 11 in the new amusement hall at Panther, W. Va., the Lathrop Mining Institute was formed, the members all being employed by the Panther and Lathrop coal companies, both owned by William Leckie.

The Institute was named in honor of the late W. A. Lathrop, who was, at the time of his death, which occurred only a few months ago, the president of the Lehigh Coal and Navigation Co. in the anthracite region in West Virginia and a stockholder in the Lathrop Coal Co.

The guests of honor were L. Blenkinsopp, mine inspector of the 13th District, who delivered an address on "The Safety and Educational Benefits Derived from Mining Institutes." He was followed by D. M. Farquharson, superintendent, Empire Coal Co., of Landgraff, W. Va., whose subject was "Cooperation Between Employee and Employer."

During the winter months an instructor in mining from the State University at Morgantown will deliver a lecture every two weeks. During the interval the men will study under the direction of a local instructor. At the close of the evening's entertainment Mr. Leckie, amid much enthusiasm, turned over the new building to the employees of the Panther and Lathrop coal companies and their families.

Harvey's Lake First-Aid Meet

By Lewis Richards*

The First-Aid Corps of the Fourth District of the Delaware, Lackawanna & Western Railroad Co., coal department, held a first-aid contest at Harvey's Lake on Tuesday, Aug. 15. The meet is the lineal descendant of the contest that used to be known as the Woodward-Pettebone meet. The 6,000 persons who were present arrived in five special trains, by street car, and by an unceasing line of automobiles. The first-aid contest was the main feature, but there were athletic events also, and in the afternoon awards were given to the most graceful dancers.

The first-aid competition resulted in a tie between the teams from Auchincloss and Bliss, both of which made an average of 99⅞. The $50 cash prize was divided between them and arrangements will be made so that transportation to the Detroit meet of the National Safety Council will be provided for both teams. The second prize of $35 cash went to the team from Pettebone, Nos. 3 and 4 shafts. This team received 99⅛ points. Truesdale shaft took third place, receiving $25 cash and scoring 98⅞ points. The captain of each team received a safety lamp.

In the mine boys' event the first prize of $15 was divided between the Truesdale breaker boys and those of the Woodward colliery. Both teams made 96 points. Another team of Woodward boys received the second prize of $10.

The Boy Scouts held a contest open to scout and church teams, Troop No. 2, of Edwardsville, taking first place and Troop No. 1, of the same town, being second.

Just before the events three problems were selected from a list of sixteen which had been chosen and dispatched to all: (1) Compound fracture of the right wrist; incised wound from point of jaw to upper end of left ear; lacerations on back and front of right leg from instep to knee. (2) Dislocation of right thigh; compound fracture of middle third of right leg with arterial bleeding. (3) Asphyxiation by gas; patient to be carried 10 ft., artificial respiration to be performed by the prone or Schaefer method.

The team of Woodward No. 17 slope had an unfortunate opportunity to exhibit its skill under actual conditions. A man was knocked down by an automobile and received a severe cut. The team dressed his injuries and dispatched the man to his home in Edwardsville.

H. G. Davis, the popular district superintendent, made a speech commending the work of the competing teams and later presented the prizes.

Including the scouts and breaker boys there were 21 teams in the contest. For lack of judges it was necessary to divide these into three sections. There were six judges, two officiating at one time. Pair one would judge section 1 in the first event, section 2 in the second event, and section 3 in the third event. The other judges were similarly distributed, so as to reduce the likelihood of any team suffering by reason of severity or involuntary favoritism in judging. As the field is somewhat small, many teams cannot contest at one time.

*Secretary, First-Aid Corps of Fourth District, Delaware, Lackawanna & Western Railroad Co., coal department.

Discussion by Readers

Certification of Mine Foremen

Letter No. 3—An interesting question has been brought forward by "Certified Foreman," *Coal Age,* Aug. 12, p. 276. Reference is there made to that clause of the Pennsylvania compensation law by which coal companies operating in the state are authorized to employ as mine foremen anyone "who, in the judgment of the operator, is a person equally competent" with the holder of a certificate. Naturally, certified men regard this as an invasion of their rights, as it makes men eligible to appointment to the position of mine foreman without having proved their qualifications, to do which the certified men have spent years of study and labor.

In order to determine whether this is a backward step in mining or to ascertain if it will prove a benefit in the long run the question must be considered from both sides. First, let us look at the bituminous mine law of Pennsylvania, relating to the appointment of mine foremen, Art. 4, Sec. 1, which reads as follows:

> In order to secure efficient management and proper ventilation of the mines, to promote the health and safety of the persons employed therein, and to protect and preserve the property connected therewith, the operator or the superintendent shall employ a competent and practical mine foreman for every mine wherein 10 or more persons are employed.

Again, the same law, Art. 24, Sec. 9, reads:

> It shall be unlawful for any operator, manager, or superintendent to employ as mine foreman in any mine, or as assistant mine foreman in any gaseous mine, any person who has not obtained the proper certificate of qualification or service required by this act.

The question arises, Why did the legislators think it necessary that mine foremen should be certified in previous years? If certification was necessary then, how much more is it necessary now when new methods of mining are employed; mine workings are further extended; complicated machinery and equipment have been installed; and systems of mechanical haulage, locomotives and cutting machines are in use that require technical knowledge and training on the part of those in charge of the work. Moreover, the mining of deeper seams and the increased demand for larger outputs have greatly increased the dangers incident to mining, not only by producing greater quantities of gas and dust, but by requiring the employment of much foreign and incompetent labor in the mine.

Coal mining today has become a science that no man can master except through a course of study, which I regret to say the new law discourages. No one will deny that the man who studies new methods of performing the work in charge is more competent than one who must depend on his previous experience under different conditions. I am glad to say that the majority of our mine foremen are men who have from 15 to 25 years' practical experience and who have acquired besides a large amount of technical knowledge by hard study. It must be admitted, also, that there are many uncertified mine foremen whose practical experience and habits of caution render them fit to hold such position. Others hold service certificates provided for by the law, who have never passed an examination.

Now, in regard to the suggestion that "some boob who has a pull will get the place ahead of you," allow me to say that this is almost equivalent to saying that the operator has more money than brains. I believe that operators realize now more than ever before that it is necessary to employ the most competent men as foremen, and the "boob with a pull" has little chance today. I believe that the new law has stimulated firebosses and assistant foremen holding second-grade certificates to strive to gain the first-grade certificate. At least two-thirds of those sitting at the last examination in this district were men who held second-grade certificates.

In closing, permit me to say that the disregard of the need of technical study in coal mining would place the industry back 40 years or more, and there is little need to fear that this will be done.

THREE TIMES CERTIFIED FOREMAN.

Spangler, Penn.

Merit vs. Favoritism in Gaining Promotion in Mining

Letter No. 3—After reading the article entitled "Promotion Based on Merit," *Coal Age,* June 3, p. 954, I looked to see the statements made therein flatly contradicted, as they are so at variance with the commonly expressed sentiments of industrial operators, not only in coal mining but in other industries.

The commonly accepted definition of merit is, I believe, the possession and practice of such virtues as make for distinction and entitle their possessor to preferment as a reward for his diligence and capability. In the treatment of this question, authorities and employers in every industry do not hesitate to emphasize the presentment that advancement of employees is based solely upon merit. It is true that their idea of merit in a person may not accord with the definition just given, but may be tinged with sentiment arising from blood relationship or political influence.

It must be admitted that the statements made in the article to which I have referred are true in practice and therefore incontrovertible, but favoritism shown a blood relation is only one form of injustice to other workers that, while it may be deplorable, is more justifiable than some other motives prompting unmerited promotion. I will cite two instances of my own personal knowledge, where the favoritism shown was not owing to blood relationship, but were prompted by purely selfish motives.

The first incident concerned the general foreman of a mine where I was employed as assistant foreman. This man had been in the employ of the company at the same plant, from the period of its development, with the exception of about 18 months when he had filled the position of superintendent of several other operations of the same company. In both positions, he performed his duties to

the entire satisfaction of his employer, but the contingencies of the times brought him back to the original position of general foreman. His place as superintendent was filled by a man who had no practical experience in mining, but was appointed to that position by reason of the fact that he was an intimate friend of the general manager. A little later the corporation went into the hands of a receiver and the division superintendent, a practical mining man, was then made superintendent. Another change followed shortly and the superintendency was given to a total stranger, a man unacquainted with the plant.

Principle of Coöperation Failed of Application in Practice

The second incident is a sequel to the first. Shortly after assuming office, the new superintendent organized a local institute of the mine officials and heads of departments, both inside and outside of the mine, the purpose being to promote safety and efficiency. The principle laid down was that of mutual interest, coöperation and toleration. The practical working of this principle failed, however, when one of the mine foremen in the employ of the company resigned to take a position as superintendent for another company. In the same mine there were four men who were competent and legally qualified to fill the vacancy made by the foreman's resignation. One of these men had been a foreman for the same company at an adjacent and intersecting mine and, as far as was known, had filled the position with satisfaction. None of these men, however, was offered the position of foreman, but a young man who had been in the employ of another corporation was appointed to the place.

Putting aside for the time the tendencies of blood relationship, and disregarding the elements of jealousy and envy that often lead to acts of discrimination in appointments, it seems as if there must be some predominating trait common to a certain class of individuals and which the employer discerns, that indicates to that official the peculiar fitness of its possessor for promotion to a higher position. Employers of labor are not in business for the fun, nor are they actuated by purely philanthropic motives. They are out primarily and all the time for the "long green," and it would be illogical to suppose that they retain unproductive material.

Disregard of Means Used To Gain Promotion

Therefore, aside from the factors mentioned above, the men who get the promotion are those who can produce the goods irrespective of the means they employ. Modern business is conducted largely with slight regard for ethics. Could employers be induced to consider the means used in producing results, there would be fewer instances of unjust discrimination. True merit would obtain promotion, which would insure greater stability to business.

Most men who have the ambition to acquire knowledge and ability through years of study that will place them in line for promotion and who keep abreast of the times by reading and the study of new methods in respect to their practical application to mining, possess the qualities that are commonly considered essential to success. Some men are naturally brilliant and attain a higher degree of proficiency than others who by dogged perseverance have acquired a capability that deserves recognition.

The claim of unmerited promotion is based upon preferment on account of characteristics that are inconsistent with the higher and nobler attributes here mentioned. The argument that the man who secures promotion because of these characteristics will eventually come to grief is no consolation to the one whom he distances in the race. My experience convinces me that, because of the conditions prevailing in the business world today, promotion is not always the reward of true merit when a man is guided by the dictates of conscience and a sense of his moral responsibility and accountability for his acts.

Windber, Penn. A. M. Iner.

Mining Thin Coal Seams

Letter No. 5—Referring to the inquiry, *Coal Age*, June 17, p. 1067, in regard to mining thin seams of coal, permit me to submit the following:

Seam No. 1 is a high-grade bituminous coal 3½ ft. thick, overlaid with bad roof having numerous slips cutting across the bedding plane. Assuming this seam lies at a depth of, say 300 ft., I would adopt the longwall method of mining and step the working face so as to prevent the slips in the roof from having too great length, which might cause the loss of the entire working face by the falling of the roof slate.

The gateways should be 10 yd. apart and 10 ft. wide, and each should be carried 5 yd. in advance of the next gate on the fast side. This advance of 5 yd. measures the length of step in the working face, and it is possible to reduce this amount if the roof improves. One disadvantage due to the slips in the roof is that the coal on the loose end of each step is apt to be crushed by the pressure, making it more difficult to mine and, perhaps, impairing the quality of the coal. The roof will also give more trouble at the loose end on this account.

Need of Good Packwalls and Removal of All Timber from Waste

In order to provide plenty of material for the first packs in a gateway, the roof brushings can be made from 2½ to 3 ft. thick. As the brushing is extended in the gateways, the material should be used to build good packwalls on each side of the road. There should be no false packings, but the stone should be built up to the roof.

All timbers should be drawn as the face is advanced, and no posts must be left standing between the packs, as this would interfere with the gradual settlement of the roof, which is so important to the success of longwall work. The building of good roadpacks and drawing of all timber prevent the bending action of the roof from affecting the gateways and reduce the cost of maintaining the roads. If the ripping of the roof in the gateways gives an excess of material over what is needed, this should be built in to the first gateways next to the main road.

Cross-headings may be required, say 40 or 60 yd. apart, and these will need a somewhat thicker brushing. If the gateways are going to the rise the packwalls on the rise side of cross-headings should be made of greater thickness. The tendency of workmen is to build a thicker packwall on the dip side of the heading, because that is less work. The coal should be well mined and allowed to break or be wedged down, as shooting the coal will increase the trouble due to bad roof. The system of longwall I

have described was that used at the Ashington colliery, Northumberland, England.

Seam No. 2 is a split anthracite seam, the upper coal being 32 in. thick and the lower coal 14 in. thick, with 20 in. of soft shale parting between them. I would work this seam by the double-stall method, driving the stalls 30 to 35 ft. in width and carrying a road up each rib. Packwalls should be built on the gob side of each road. The material from the 20-in. parting should be stowed in the gob, except what is used in building the packwalls at the side of the roads. The thickness of pillars between the stalls should be such as to conform to the depth of cover and prevent the possibility of a squeeze.

Thickness of Pillars in Machine Work

Longwall or breast machines can be used to undercut the coal. In this connection, let me say that it would be well to make the thickness of the pillars between stalls a multiple of the depth the machines will cut. For a 5-ft. cut, say make the pillars 20 ft. wide. The parting being soft will probably admit of the cut being made in the shale just above the bottom coal. It may be thought wise to leave a smaller pillar between the stalls than that I have mentioned, so that these pillars can be drawn back by pickwork, instead of using machines.

Seam No. 3 is also anthracite; upper coal, 14 in. thick; bottom coal, 26 in. thick; and a hard shale parting 27 in. thick between them, which gives a total thickness of 67 in., or 5 ft. 7 in. In my opinion, this seam can only be worked successfully by a longwall method similar to that I have described for working Seam No. 1, except that the cross-headings may be driven closer together and at an angle with the working face. In this case, it will not be necessary to step the face, which should be as nearly circular as possible and continuous, so as to allow the use of longwall machines. I would make the undercut somewhat less than is customary with coal-cutting machines—say 4½ or 5 ft. in depth. If the parting is too hard for the machines, the cut should be made in the bottom coal.

That there may be sufficient headroom on the main roads I would brush the roof, provided this is not too hard, and it would then be better to lift bottom.

Linton, Ind. W. H. Luxton.

Electrical Mine Equipment

Letter No. 1—The reading of Letter No. 1, entitled "Steam vs. Compressed Air Line," *Coal Age,* July 15, p. 121, raises the question of the relative value of electrical equipment in mines. I agree with J. P. Stone, in preferring the use of electricity to either compressed air or steam in the case there considered. I am an advocate of the use of electricity in both coal and metal mines.

The use of electricity is rapidly extending to all parts of the world, owing to the higher efficiency and greater convenience of such installations. It is unnecessary to add that, with the increased cost of producing and marketing coal, every item of economy should receive careful consideration. Most mine managers are aware that greater economy and higher efficiency are obtained in the generation and distribution of electrical power wherever the size of the mine will warrant the installation. In the use of compressed air in mines, the difficulty of obtaining the required working pressure increases with the extension of the pipe line, and this difficulty is not experienced to the same degree in the transmission of electrical power.

Electricity provides a simple and thoroughly flexible system for the distribution of power, especially in mine workings where frequent changes are necessitated by the progress of the development. Another point that is of great advantage is the ease and rapidity of making an electrical installation, which only requires the stringing of the wires that conduct the current to the points where the power is to be applied.

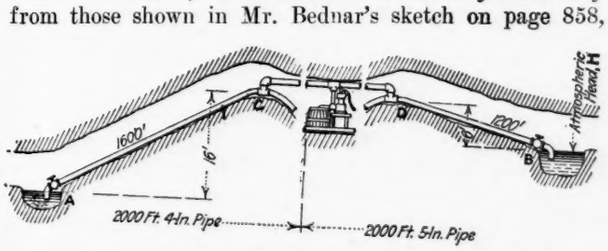
Experience gained in making many large installations proves that the loss in power transmission over considerable distances is small, and the cost of maintenance of the system much lower than that of other systems. In order to obtain the full advantage of an electrical installation, care must be taken in the proper selection of the equipment so that it will fulfill the conditions required. All electrical installations should be made under the direct supervision of a competent electrician or electrical engineer.

T. O. Hughes,
Windber, Penn. Mining Electrician.

Siphon Line in a Mine

Letter No. 4—The letters already written, in reply to the inquiry of John Bednar, *Coal Age,* May 13, p. 858, leave little to be said by way of improvement. But my thoughts carry me back some 3,000 mi., to a mine where I worked on the other side, and where I became deeply interested in the troubles of the foreman who made vain attempts to convey water by a siphon to a very dusty part of the mine.

As I remember, the conditions did not vary materially from those shown in Mr. Bednar's sketch on page 858,



PRIMING A SIPHON HAVING TWO SUMMITS

except that the distances were somewhat greater and there was a swamp between the points *C* and *D*, which gave two summits in the siphon line, as shown in the accompanying figure. Jim, the foreman, had the habit of always trying to work out his troubles by himself. The pipe line had been completed for about two weeks and was repeatedly filled with water carried in water barrels to each summit in the line, but the water refused to flow and everybody was saying, "Poor old Jim can't get his siphon to work." So much attention had he given to the siphon that his efficiency as a mine foreman was beginning to wane.

About this time notices were posted announcing a football supper, and Jim was on the program, as usual, for he was a fair singer and had a good baritone for rendering old favorites. On this occasion, however, the chaffing of the boys had taken away his appetite for pleasure, and when his turn came he gracefully declined. The chairman, who was manager of the mine, advised him that he must find a substitute or set it up for the boys.

On hearing this, Jim turned quickly to the master mechanic and said: "Come on Dick and help us out with a recitation to satisfy the crowd. Make it up as you go along." Dick was equal to the occasion and walked to the front as the crowd cheered. In reply to the chairman's question, "What is it to be?" Dick promptly replied, "Siphons." When quiet was finally restored, Dick began and recited in clear tones the following:

Siphons will not give much trouble
If we could omit the bubble
From the water on the crown
When it commences to run down.
Stop all leaks, is the step to cure;
Then the water will run for sure.
Other conditions being right,
See that all joints are made tight.
Prime me well, I'll do the work;
It is my nature not to shirk.

As Dick bowed and started back to his seat, Jim remarked, "You are pretty well primed yourself, Dick." This little episode established the best of relations between Jim and Dick, who put their heads together and devised a means of overcoming the difficulty in the siphon line in the mine. The distance between the two crowns at *C* and *D* was not great, and it was decided to break the line at these points. Two tees were then inserted in the line and, by means of nipples and elbows, the two summits were connected by a separate pipe connection, which not only served as an air chamber for the air accumulating at those points, but permitted the siphon to be filled with water at each summit by means of a handpump that drew water from a water-barrel placed as shown in the sketch.

The scheme worked well, proving that two heads are always better than one. The siphon, which the boys christened "Dick," was in operation for several years after, and it was customary, when a man was going in, for another to call out, "Prime Dick as you are passing." By this means the air was constantly drawn from the pipe line and replaced with water as needed. The priming, done frequently, only required from 15 to 20 strokes of the pump, to make the flow of water continuous.

Dunbar, Penn. JOSEPH A. GREAVES.

Letter No. 5—I have followed with great interest the descriptions given in previous letters regarding the laying of siphons in mines. I have installed and operated successfully nine siphons in different mines, where the lengths of the pipe lines ranged from 300 to 1,800 ft. and the vertical height varied from 8 to 26 ft., the latter being, in my opinion, about the limit of a suction lift in mine work, for elevations less than 2,000 ft. above sea level. At greater elevations than this, the suction lift is much reduced. In the installations I have made the longer leg of the siphon was invariably on the inby end of the line.

There are only two principles that I consider as really essential to the successful operation of a siphon. They are, tight joints and a complete abstraction of air from the pipe line. The first of these requisites is easily obtained by the use of white lead in all the joints when laying the pipe.

When the pipe has been laid, the siphon must be primed in order to start the flow. This is done in different ways. Thus, the pipe may be filled from an opening at the summit by pouring water into it, having first plugged each end of the pipe so as to prevent the water flowing out at those points. When the pipe is full the opening at the summit is closed and the plugs drawn, first, the one at the upper or inlet end and, afterward, that at the lower or discharge end of the pipe line.

Another method of filling a pipe is by installing a small hand pump at the crown of the siphon and sucking the water from the upper basin to the crown, having first closed the discharge end of the pipe with a tight plug. As the water is raised to the summit by the pump, it is allowed to flow slowly into the discharge leg of the siphon until the entire pipe is full. I have sometimes placed the pump at the lower or discharge end, and drawn the water from the upper basin through the entire length of the pipe. In order to fill the pipe with water in this way, all the joints must be perfectly tight and a good pump used.

In any case, when filling the pipe, or, as we say, when priming the siphon, care must be taken to do it slowly in order that no air will be entrapped in the pipe, as this would interfere with the successful operation of the siphon. I have found it a good plan to place a foot valve at the intake end of the pipe as this is of great assistance in priming. I have also found it of advantage to make the discharge end of the pipe somewhat smaller, which helps to prevent the entrance of air into the pipe at this point.

EXAMPLE OF LACK OF PROPORTIONING SIZE OF PIPES

I always consider it a bad plan to extend the discharge end of the siphon to a point more than 34 ft. of vertical height below the summit, this being the water column supported by atmospheric pressure at sea level. I have found that a greater fall than 34 ft. tends to pull the water in the outer leg of the pipe faster than the atmospheric pressure will force it into the other end and, as a consequence, air bubbles separate at the summit and these soon interfere with the operation of the siphon. Although I have seen many siphon lines that would not work, I have never had the same experience myself.

When the pipe line has been well laid, and the joints are tight, I would recommend priming the siphon by means of a pump at the discharge end, for the reason that this method does not necessitate hauling water to the summit and is generally more effectual in excluding air from the pipe. JOSEPH VIRGIN.

Moundsville, W. Va.

[The above letter, like many others that have been written on the siphon, while drawing attention to many practical points that must always be considered in the laying of a pipe line in a mine for this purpose, shows the lack of the writer's appreciation of the fact that a pipe line should always be proportioned so that the flow of water in the suction end from the supply basin to the crown, under atmospheric head, shall be equal to or greater than the flow in the discharge end from the crown to the lower basin, under gravity.

This point was emphasized in the reply to the original inquiry that appeared in *Coal Age*, Vol. 9, p. 858. Mr. Virgin states, in his letter, that he has "found it of advantage to make the discharge end of the pipe somewhat smaller," and again, he says it is "a bad plan to extend the discharge end of the siphon to a point more than 34 ft. of vertical height below the summit, this being the water column supported by the atmospheric pressure at sea level," adding, "I have found that a greater fall than

34 ft. tends to pull the water in the outer leg of the pipe faster than the atmospheric pressure will force it into the other end."

It is needless to say that this trouble is due to the lack of such a proportionment that the size of pipe will conform to the length and vertical rise or fall in each end of the line. When this is not done the siphon tends to empty itself, or unnecessary trouble is experienced from the accumulation of air at the crown. When the pipe is properly proportioned, a siphon will run full, which helps to sweep away the air that would otherwise accumulate at the summit. Reducing the size of pipe at the discharge end, as mentioned by Mr. Virgin, has the same effect as throttling the flow of water at that point by a valve, which is often resorted to as an expedient to prevent a siphon from running dry when the pipe is not proportioned to suit the conditions.—Editor.]

Coal Mining, Politics, and Labor

Letter No. 2—The Foreword that appeared in *Coal Age*, Aug. 5, written by Carl Scholz, will cause many who read it to realize the gulf that has come to separate the men who control the capital of our country and the men who produce the commodities that make it possible for capital to exist.

Mr. Scholz deplores the lack of interest taken by the business men of the country in the politics of state and nation, claiming that the labor vote has increased rapidly in strength in recent years, and that many representatives of labor now occupy places in the state legislatures and other important positions in the Government. Mr. Scholz's assertions, in this respect, are hardly supported by facts, which I believe will show that not 10 per cent. of Congress are labor men.

Although one of the great mass of producers against which Mr. Scholz's remarks are largely directed, I wish to be fair and not influenced by a natural bias that pertains to my environment. I realize that I view the industrial question that interests us all from the proletarian standpoint, as I am a wage earner and not a capitalist. My father was poor and, in his distress, took me into the mine at the early age of eight years, where I have worked ever since. The conditions that surround the wage earner in a mine are severe and beyond his power to control and must remain so until labor and capital see things as the good Lord would have us see them.

The Golden Rule the Only Solution

The practice of the golden rule, "Do unto others as you would have them do unto you," is the only thing that will work a change in our whole economic system. In other words, the great and good men of the future—men who are really worth while—will be those who are more desirous of improving the conditions of their fellowmen than of accumulating great wealth. Men with an income of $100,000 a year will realize that they have the means to alleviate the burdensome condition of others who have not the same opportunities, but whose daily toil contributes to their wealth.

Mr. Scholz says, "In this land of opportunity we all start with the same advantages." I would that he could realize that the same opportunities are not open to all men, even though they possess the ability to avail themselves of the advantage thus offered. I feel that we should all do what lies in our power to bring these two great classes of men together that they may come to realize each other's conditions and view the problems of life from a common standpoint.

In his argument, Mr. Scholz speaks of the Clayton bill as permitting "laborers and farmers to coöperate and organize for their mutual protection," while, he says, the Sherman bill "makes combinations of capital illegal." But, the past history of the Sherman bill, when reviewed, shows, in the Standard Oil decision affecting $29,000,000 of capital and the Tobacco Trust involving $90,000,000 of capital, that the measure was much needed to stay these great accumulations of wealth and power in the country.

This, however, is ancient history. The question of the hour, that should be carefully considered by the big men of the country, who control such great business interests as Mr. Scholz, is, What can be done for the welfare of the employed whose labors are so necessary to industrial success? A little reflection will show plainly that the great mass of workers have come to regard their employers with a grain of suspicion, and even doubt the sincerity of many of their welfare movements.

To Restore Confidence Among Employees

The question then is, How can confidence be restored so that greater harmony may prevail? The answer to this query is, By operators providing such simple necessities for their employees' comfort, as for example, drinking fountains of pure running water at the head of the shaft where the tired and thirsty men coming out of the mine can refresh themselves before going home. The washhouses provided by many large companies are a step in this direction.

Another provision that would show the consideration of employer for employed is a suitable shed or other protection at the head of the shaft that would not make it necessary for miners to stand for a half-hour or less in a driving rain or snowstorm before being lowered into the mine. Many a miner goes to his working place drenched to the skin, for the lack of such provision at the shaft. Simple efforts such as these would be a dollar-and-cents investment and would eradicate from the minds of workers that rebellious feeling that often prevents them from doing an honest, sincere day's work in return for their daily wage.

I want to refer to one other point, which relates to the general welfare of coal mining in the different states and districts. These thoughts were aroused by reading the two editorials in the same issue of *Coal Age*, page 233, entitled "What Are Fair Freight Rates?" and "Ultimate Outcome of Unionism." Owing to the different conditions governing coal mining and the marketing of coal in different localities, we find operators and miners in one district standing together in opposition to their brother operators and miners in another district and engaging in an industrial war.

In such cases, the employer and employed stand side by side in the fight, because their interests are one. The question of the transportation and marketing of coal is a difficult one and should be carefully studied to eliminate petty strikes in the industry. While my views may seem pessimistic in some respects, I want to say that I see a brighter future dawning—one of goodwill to all men.

Nanticoke, Penn. W. A. Barrett.

Inquiries of General Interest

The Hydraulic Ram

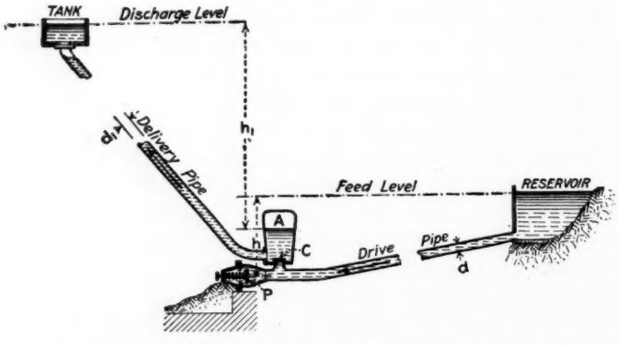
Will you kindly explain the principle and mode of construction of the hydraulic ram and its application in coal mining. Our camp has a good reservoir of pure water at an elevation of about 50 ft. above the surface plant at the shaft. This head is sufficient to supply all the water required at the plant; but, to supply the town 400 ft. in elevation above the shaft, it has been necessary to pump the water from the reservoir into a large supply tank on the hill. Kindly advise if we could not avoid the expense of pumping by installing a hydraulic ram at the shaft that would elevate the water to the tank automatically. MINING ENGINEER.

———, Ill.

The hydraulic ram, when properly installed, is a very useful and effective means of elevating water to a height a number of times greater than the supply head. Its action is automatic and continuous.

The principle of the hydraulic ram is the utilization of the kinetic energy of the flow of water in the drive pipe leading from the supply basin or reservoir to the ram. Good results are obtained when the drive pipe is laid to a grade of 1:6 or has a fall of 1 ft. for each 6 ft. of length of pipe.

The general arrangement is shown in the accompanying figure. At the lower end of the drive pipe is a puppet



GENERAL ARRANGEMENT OF HYDRAULIC RAM

valve *P*. This valve is held open by a spring coiled about the valve stem, as shown in the figure. The tension of the spring is so regulated, that when the water in the drive pipe attains its full velocity, the valve will close under the pressure of the water. Any arrangement that will make the closing of this valve more sudden will improve the action of the ram, as a greater kinetic energy is thereby transmitted to the water column in the delivery pipe through the clack valve *C*, which is raised by the force of the water below when the puppet valve closes.

In order to maintain a more or less continuous flow of water in the delivery pipe, the air chamber *A* is employed. The compression of the air above the water in this chamber is utilized to keep the water flowing in the delivery pipe during the brief period that the puppet valve is open and the clack valve closed. The velocity of the water fluctuates with the movement of these valves, the entire action being a pulcating movement. Again, as the pressure in the air chamber reduces, the puppet valve is forced open by the spring at the same time that the clack valve closes.

The diameter of drive pipe is given by the formula,

$$d = \sqrt{\frac{Gh_1}{12h}} \qquad (1)$$

d = Diameter of drive pipe (in.);
G = Desired delivery (gal. per min.);
h = Feed head (ft.);
h_1 = Delivery head (ft.).

The diameter of the delivery pipe should be about one-half that of the drive pipe.

It is now necessary to calculate the velocity of the water flowing in the drive pipe at the moment the puppet valve starts to close, by the formula

$$v = \sqrt{\frac{2ghd}{4fl + (2r^4 + 1)d}} \qquad (2)$$

v = Velocity of flow in drive pipe (ft. per sec.);
g = Acceleration due to gravity (32.16 ft. per sec.);
f = Coefficient of friction of water in pipe (for a clean pipe, $f = 0.006$);
l = Length of drive pipe (ft.);
r = Ratio of diameter of drive pipe to diameter of puppet-valve opening.

The flow of water in the delivery pipe is given very closely by the formula

$$G = 2.45\sqrt[3]{\frac{ld_1v^2}{4fl_1 + 50d_1}} \qquad (3)$$

It is of advantage not to have the drive-pipe grade too long. When the reservoir or supply basin is at a great distance from the location of the ram, the pipe line can be laid level, except the last 200 or 300 ft. from the ram, which should have a grade of 1:6. In general, the feed head should be from one-tenth to one-fifth of the delivery head.

To illustrate, a ram that will deliver, say 25 gal. of water per minute at an elevation of 400 ft., under a feed head of 50 ft., will require a 4-in. drive pipe, having a grade of 1:6 for a distance of 250 ft. and a 2-in. delivery pipe. The velocity of the flow in the drive pipe at the moment the puppet valve starts to close will be about 19 ft. per sec. Assume diameter of puppet valve = 3 in. and length of delivery pipe l_1 = 2,000 ft.

Correction

In the inquiry, in regard to removing gas in rise headings, *Coal Age*, Aug. 12, p. 281, the location of correspondent was given as Gibson, N. M., instead of Gibson, Penn. There is practically no gas in the Gibson mines in New Mexico.

Examination Questions

Miscellaneous Questions

(Answered by Request)

Ques.—Why is it dangerous to use more than one kind of explosive in the same drillhole?

Ans.—Different grades and makes of powders have different rates of burning, some slower, others more rapid. The explosion of black powder depends on the generation of a certain quantity of heat, which requires more time in some powders than in others. Hence, when different grades of powder are mixed in the same drillhole, the powder that burns more rapidly or requires less heat for its explosion will fire first, while the other powder will be blown into the air before exploding. Thus, a portion of the explosive force of the charge is expended on the air, which is a dangerous condition in coal mining, especially where gas or fine inflammable dust is present.

Again, other powders detonate instead of burning quietly upon ignition. It is always dangerous to mix such a powder with ordinary black blasting powder.

Ques.—A fire is discovered at the face of an airway. There are ten chambers being worked on the gangway, and these are giving off explosive gas. The air current enters the airway and returns through the gangway and chambers to the main return aircourse. How would you proceed to extinguish the fire with due regard to safety?

Ans.—Withdraw the men working in the chambers or gangway promptly and permit no one to enter the gangway. Using safety lamps, proceed with necessary caution up the airway and start to open a crosscut as near as practicable to the seat of the fire, so as to short-circuit the air at this point and prevent it from passing over the fire. It is fortunate if the chambers are all outside of this point; otherwise, a brattice must be extended, from the outby corner of the crosscut on the gangway, forward so as to conduct the air up the gangway to the mouth of the last chamber, if this is possible. Also, a brattice must be erected on the gangway just inside of the mouth of that chamber, and another on the airway inby from the crosscut just opened.

In the meantime, efforts must be made to fight the fire by the best means available, using water, steam or carbon dioxide. It may be found advisable to shut off the fire by building permanent stoppings both on the gangway and the aircourse, and allow the fire to smother itself. In that case, by building the first stopping on the gangway, the gases produced by the fire will be confined and the danger of explosion will generally be less, although work on both of these stoppings should be in progress at the same time, the gangway stopping being closed first and shortly after that the stopping on the airway should be closed.

There is some difference of opinion in regard to the building of the first stopping when sealing off a mine fire. Some prefer to close the intake side first. But the best practice is, having first short-circuited the air, to close the return and after that to seal the intake.

Ques.—What do you consider the most efficient method of timbering in chambers where a fireclay roof exists?

Ans.—Assuming the fireclay is of considerable thickness, or more than can be conveniently taken down, a system of forepoling may be necessary to protect the miner at the face. Two or three rows of timbers should be maintained parallel to the face, in each chamber, the rear row of timbers always being drawn as a new row is set in place. Where forepoling is required to hold the roof it will be necessary to use crossbars above the posts to support the spiles, which are driven forward over the crossbars as the face is advanced. This will only be necessary, however, where the fireclay tends to fall between the timbers.

Ques.—What are the chief features in connection with properly covering the entire surface of the end of a prop with a suitable wedge?

Ans.—It is customary to use a cap-piece of comparatively soft wood above a post, in order to distribute the pressure over a greater area of the roof and thus prevent the head of the post from being forced into the strata, and further to bind together the fibers at the top of the post. The cap-piece should be a little wider than the head of the post and from 18 to 20 in. in length. If this is tapered in the form of a "wedge," the roof pressure will not be evenly distributed over the head of the post, unless the latter is cut to correspond to the taper of the wedge. It is better to use a flat cap-piece instead of a wedge when setting a post. A post should not be set too tight, as the settlement of the roof will often break the timber when it is set tight between a hard roof and floor. A post should only be set tight enough to hold its position.

Ques.—What safe method would you adopt to work breasts on a pitch between 50 and 75 deg., the vein being from 5 to 7 ft. thick? Explain fully.

Ans.—Drive the breasts to the rise of the gangway on the full pitch of the seam. Assuming the gangway is driven in the seam, a chute is started in the center of each breast, on the rise side of the gangway. The chute is driven narrow for a distance of 6 or 8 yd., depending on the hardness of the coal, and then widened out to the full width of the breast. A manway is also driven to the rise of the gangway, in the center of each pillar. At about the same distance (6 or 8 yd. above the gangway) the manway is branched to form a Y, each branch connecting with the breast on either side, where it has attained its full width. From this point, manways are continued up each side of each breast, as the work advances. The manways are constructed in the breasts by setting timbers about 2 ft. from the rib. Planks are spiked to these timbers so as to form a good chute for the coal as it is mined. When mining a breast the men stand on the broken coal in the chute. They gain access to the face of the breast by means of the manway on either side. The coal is drawn from the chute only as the work advances, so as to give the miners a good foothold or standing at the face.

Book Reviews

An Old Friend in a New Guise

COAL MINERS' POCKETBOOK: Principles, Rules, Formulas and Tables. Formerly the Coal and Metal-Miners' Handbook. Pp. xxvi + 1150 + 22 index; 4⅛x6⅞ in.; adequately illustrated. McGraw-Hill Book Co., Inc., 239 West 39th St., New York, publisher. Leather. Price, $4 net.

Every little while someone writes to "Coal Age" and desires to be directed to some book which covers coal mining completely. Hitherto it was hard to recommend any American book which by the broadest interpretation could be regarded as filling that description except the textbooks of the International Correspondence Schools.

But the Coal Miners' Pocketbook was qualifying for this place, and now after revision and elaboration it comes very near the point in which it covers all the phases of coal mining. Always a valuable handbook, it is now more valuable and more complete than ever.

It will only be necessary to quote from the preface of this, the eleventh edition, to show that the book is largely rewritten. While in revision the name has been changed from "The Coal and Metal Miners' Pocketbook" to that of the "Coal Miners' Pocketbook" and in the process much metal-mining information has been perforce omitted, yet it is a bigger book than ever and now reaches 1,172 pages.

New Sections Added and Old Ones Enlarged

The preface reviews the changes made as follows:

The subjects of weights and measures and mathematics have been entirely rewritten and greatly enlarged. The department on surveying has been expanded to include leveling with the aneroid barometer, so much of railroad surveying as is necessary at mines and the determination of the meridian both by solar and pole-star observations; and to it have been added some practical notes on surveying as ordinarily practiced in flat seams.

Under mechanics, strength of materials, etc., will be found complete tables of specific gravities and weights of various substances per cubic foot. The department on concrete construction is entirely new and complete and is of timely interest. Hydrostatics and hydraulics have been enlarged by the addition of entirely new tables. Pump machinery now includes centrifugal pumps.

The department on fuels has been practically rewritten and now contains the best formulas for calculating the heating values of coals from their proximate and ultimate analyses, as well as complete tables of analyses of American and foreign coals. The notes on prospecting include the newer types of drilling machinery. The matter on mine timbering is practically new and includes notes on the preservation of timber, steel timbers, etc.

The subject of flushing culm has been brought up to date with numerous examples drawn from recent practice. The subjects of explosives and mining machines have been rewritten on the lines of modern practice. Under hoisting and haulage will be found much entirely new matter on gasoline and storage-battery locomotives, and the subject of tracklaying has been entirely rewritten. The subject of the treatment of injured persons is now up to date, and the glossary has been enlarged.

Lacks in Safety Devices Specific to Mining

As has been stated, the book lacks almost nothing that should be included. There is not enough perhaps on regulation safety devices for what are distinctively mine hazards. Nothing is said apparently about detaching hooks, keps, dogs, safety catches, overwind devices and car couplings, and in timbering no reference is made to the French system of extending "allanges" to the working face. But these are small omissions at most.

The glossary is a part of the work that is perhaps not extremely important. Still, realizing how much difficulty the reviewer has had in understanding English books, he does wish that many English terms had not been omitted. And perhaps some persons not acquainted with American phraseology may wish the list of native words were generously extended.

Among the many words missing are gob heading, shoofly, skinner, dummy, dummy pit, barney pit, niggerhead, cocker sprag, peacock coal, rooster coal, brick coal, mother coal, dead coal, trunnel head, face heading, dataller, dayman, drawrock, sulphur ball, flake sulphur, water cutter, car pusher, overburden, double entry, plaster joint, cross-hairs, eyepiece, object glass, vertical circle or arc, breast machine, crab or reel locomotive, turret machine, retarding conveyor, car retarder, trommel, bar cutter, shortwall machine, longwall machine, strike, suspension, button strike, coke leveler, coke drawer, revolving dump, first aid and bustle.

Only a few of the many meanings of some words are given. Thus "snubbing" is now generally used not to express the making of an undercut, but the shaping of an electric-machine cut so that the coal on falling will roll over and be in shape for loading. This is done by hewing coal off the upper side of the cut till its cross-section is roughly of a V-shape.

"Spreader" is defined solely as a timber stretched across a shaft or slope. The mule's "spreader" receives no notice. The word "scraper" is defined only as a tool and not as a workman. "Neck" is a "cylindrical body of rock differing from the country (rock) around it." No attempt is made to define the neck of a room. Nor is the word "pit" defined as a low trackage point where cars are assembled.

"Rashings" is not given, though the word is defined under "rash." "Buddy" also is spelled "butty" and the reader might well overlook it if he searched the glossary for the word as it is most generally and most acceptably spelled by the mining men. "Brattice" is described as a lining or partition—a definition that is somewhat inadequate. "Pentice" is described only as a timber erection, whereas the word is not so exclusive and may refer to a body of rock left for the purpose of protecting workmen in a shaft, as when a shaft is being lowered and a pentice of rock is left above the shaft extension to protect the men from falling rock and coal which may descend from the moving cages.

Words That Might Be More Precisely Defined

"Warning lamp" is defined as a safety lamp with certain delicate apparatus, and the statement is added that "as small a quantity as 3 per cent. can be determined by this means." Apparently a decimal point was omitted before the figure 3. The "theodolite" is described as an engineers' large transit with attachments. In practice a "theodolite" is an instrument like a transit, but with a telescope so long that it cannot be revolved through a full circle on its bearings. Hence with the theodolite whole angles are measured, while with the transit it is usual to measure only the change in direction from the previous line.

"Bank to bank" is given the definition of "shift." That may have been its original meaning, though it is likely that "bank to bank" was always rather an adverbial expression than a substantive and meant "from the time the workman entered the mine till the time he left it." This may be more than a shift, for the shift may count from the time he reaches the working face and may end when he leaves it. Or again "bank to bank" may be less than a shift, for drivers might well be paid from the time they leave the mule barn till they return to it. At present the miners want to make "bank to bank" mean shift or less than a shift. The word is a loose one and might well be avoided till it is officially defined. All we know definitely about it is that it does not mean "shift" or it would not be a matter of dispute whether the time of working shall be reckoned "from bank to bank." Everybody admits that the miner must work a full shift. The dispute is on the duration of that period.

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Are You Burning Up Profits?

THE COST OF POWER: A Big Business Problem. By Gerald B. Gould and Carleton W. Hubbard. Pp. 120 + 4 p. index; 4⅝x6⅝ in.; 13 illustrations. Fuel Engineering Co. of New York, 106 East 19th St., New York, publisher. Price, $2 net.

This little book, produced primarily to advertise the service of the Fuel Engineering Co., is a meaty, though elementary, publication well worth reading. To the man who assumes that coal is just coal it is a revelation. He begins to realize how various are the products of Nature's workshop and to understand the reason why the modern power house demands that the material supplied shall satisfy certain minute specifications.

The man who wants to get his information in a simple manner has a welcome place for such books as these in his library. The incentive of wanting to sell something—service or supplies—quite usually puts a zest into the medium used for that purpose, which zest technical writing too often lacks. If the average author would write as simply and directly as the advertising man, perhaps so many books would not go seeking for readers.

Coal and Coke News

Washington, D. C.

Several weeks ago Hon. George F. O'Shaunessy directed the attention of the Federal Trade Commission to the dissatisfaction caused in Providence, R. I., by the alleged high retail prices of anthracite coal, which had prevailed for some months in that city. Complaint was being made in particular, it was stated, that consumers in Providence had been paying substantially more for coal than consumers in Boston, although the latter city was farther from the coal field than Providence.

An inquiry was immediately instituted by the Commission for the purpose of determining whether the high prices alleged to exist in Providence were due to any act or practice which the Commission could reach through the quasi judicial powers conferred upon it by the Trade Commission Act or the Clayton Act. An agent was sent to New York, Providence and Boston to investigate conditions existing in the purchase and sale of coal by dealers in the two latter cities.

The investigation disclosed that coal dealers in Providence, Boston and other New England points purchased their requirements of anthracite coal from the large coal-mining companies by which it is mined and shipped to such tidewater points as New York, Port Richmond and Perth Amboy. Certain of the coal-mining companies, as well as some of the coal-carrying railroads, own fleets of sea-going coal barges. The barges owned by the railroads are distributed among the coal-mining companies shipping over their lines in accordance with the rules established by the Interstate Commerce Commission for the distribution of coal cars, and in some instances the rates for transporting coal by these barges are filed with that Commission.

For a number of years prior to the beginning of the present European war the rates charged by the coal-mining companies for transporting coal by barge were somewhat higher than the same service could be procured for from transportation companies having barges for hire, and, while the coal-mining companies selling coal at tidewater points were apparently willing to name the Providence dealers a rate for coal alongside the wharves at Providence, based on the price at the port of shipment plus the companies' rates for carriagee by barge to Providence, the dealers preferred to make the saving which could be effected by chartering outside barges. On the other hand, Boston dealers have for some years had their coal transported from tidewater points to Boston by the coal-mining companies, and the practice grew up of the latter companies quoting Boston dealers a price alongside the wharves at Boston, the price being based on the quotation at the port of shipment plus the companies' rate of carriage by barge to Boston.

Since the beginning of the war there has been an abnormal demand for water craft of all descriptions which has resulted in a large increase in the charter rate for barges. The coal dealers in Providence who have heretofore hired barges from transportation companies have found themselves compelled to pay from 90c per ton to $2 per ton for transporting coal from tidewater points to Providence as compared with a rate of about 40c. per ton prior to the beginning of the war. On the other hand, the coal-mining companies have continued to send their barges to Boston at rates of from 50c. to 65c. per ton—rates which have been in effect since some time prior to the war. From these figures it will be seen that Providence dealers have paid at times from 40c to $1.50 more for transporting coal than the coal-mining companies have charged Boston dealers. It must be remembered, however, that a small percentage of the coal purchased by Providence dealers is also shipped in barges supplied by the coal-mining companies and for this service the dealers pay about 45c. per ton, hence insofar as the coal-mining companies send barges to Providence at all, the rate charged by them is apparently not higher proportionately, than that charged by them to Boston.

From figures obtained from dealers in Providence and Boston it appears that in January, 1916, consumers in Providence paid $1.33 more per ton for stove coal, $1.58 more for nut coal and 54c. more for egg coal than was paid by the Boston consuming public. Much of the higher price paid by Providence dealers is unquestionably directly attributable to the higher cost of transportation already explained.

During the month of June, 1916, egg and stove coal were only 25c. per ton higher in Providence than in Boston, while pea coal was 50c. higher in the former than in the latter city. The fact that prices in the two cities were much more nearly equal in June than in January is to be attributed to two causes, The wholesale price of coal has advanced since January, while the cost of transporting coal from tidewater points to Boston has remained the same. The price of coal in Boston has therefore advanced. Although the Providence dealers have of course been compelled to pay the advanced price for coal, the amount of coal shipped to New England points in summer is smaller than in the winter months and for this reason Providence dealers have been able to secure barges from the coal-mining companies to transport practically all of the coal purchased by them during the last few months. The saving in transportation thus effected has enabled Providence dealers to make prices but little higher than in Boston. With the return of winter the coal-mining companies will probably send the barges now being sent to Providence to Boston to supply the increased demand at the latter point; and as the mining companies do not have a sufficient number of barges to supply the demand at both points, the Providence dealers will, in this event, be again compelled to charter barges from other companies at the prevailing high rates.

Having made this brief statement of the facts developed by the inquiry, it appears necessary to do little more than mention the provisions of law which the Commission is charged with enforcing which could have any bearing on the situation.

Section 5 of the Trade Commission Act provides that unfair methods of competition in interstate commerce shall be unlawful and authorizes the Commission to prevent the use of such methods Section 2 of the Clayton Act is as follows:

"That it shall be unlawful for any person engaged in commerce, in the course of such commerce, either directly or indirectly to discriminate in price between different purchasers of commodities, which commodities are sold for use, consumption or resale within the United States or any territory thereof or the District of Columbia or any insular possession or other place under the jurisdiction of the United States, where the effect of such discrimination may be to substantially lessen competition or tend to create a monopoly in any line of commerce: Provided, That nothing herein contained shall prevent discrimination in price between purchasers of commodities on account of differences in the grade, quality, or quantity of the commodity sold, or that makes only due allowance for difference in the cost of selling or transportation, or discrimination in price in the same or different communities made in good faith to meet competition: And provided further, That nothing herein contained shall prevent persons engaged in selling goods, wares or merchandise in commerce from selecting their own customers in bona fide transactions and not in restraint of trade"

It does not appear from the facts so far in hand that the action of the coal-mining companies in continuing to send their barges to Boston at the rates in effect prior to the beginning of the war is an unfair method of competition within the meaning of Section 5 of the Commission Act. Nor does there appear to be a price discrimination by the coal-mining companies in violation of Section 2 of the Clayton Act above quoted. The difference in prices quoted the Providence dealers f.o.b. port of shipment, and the prices quoted Boston dealers alongside the wharves at the latter city makes only due allowance, apparently, for the rate of transporting the coal to Boston by barges owned by the coal-mining companies. For these reasons it would appear that the practice complained of is not one which can be reached under the provisions of law which the Commission is charged with enforcing.

While it appears that the Commission cannot correct the conditions complained of by affirmative action under its quasi judicial powers, attention was called to the fact that the Senate has recently directed the Commission to investigate conditions in the anthracite coal industry, and it is suggested by the Commission that the policy of coal-mining companies in supplying transportation facilities to dealers in some cities while not supplying the same facilities to dealers in other places, and the effect of this policy on the price of coal in various cities or localities, might properly be made the subject of inquiry in connection with this investigation.

It was stated that some inquiry along this line would probably be included in the scope of the investigation of the anthracite coal industry.

Lower Rates Are Sanctioned

Permission has been granted by the Interstate Commerce Commission to the Illinois Central, and the Missouri, Kansas & Texas railroads to establish lower rates on bituminous coal from Illinois mines to Moberly, Mo., the shipments being made via East St. Louis, Ill. The order permits a rate of $1.25 per ton from group 1 mines, $1.30 per ton from group 2 mines, $1.375 from group 3 mines, and $1.40 from group 4 mines, with the proviso that these rates shall not be exceeded to the intermediate points.

HARRISBURG, PENN.

Figures of accidents in Pennsylvania from Jan. 1 until Aug. 15 show there were 1,429 lives lost in the state by mine, industrial and public-service accidents. Of this amount, the industrial division leads with 626, the mine accidents being a close second with 618, and the public-service third with 185. Of the fatal mine accidents, 344 occurred in the anthracite region and 274 in the bituminous mines.

Deputy Attorney General William H. Hargest handed down an opinion on Aug. 24, in response to a request from James E. Roderick, chief of the Department of Mines, on the question of the authority of the check weighman to test scales when he thinks they ought to be tested. The check weighman is provided for under the act of June 1, 1883, to protect miners in the bituminous-coal region. Mr. Roderick was advised that the check weighman has the necessary authority, provided he does not interfere with the working of the mines. In case of dispute the matter may be referred for decision to the mine inspector of the district.

Amendment of the compensation law to conform to those of other states and an investigation of the Coaldale State Hospital, on the ground that the people have no confidence in it, are demanded in resolutions adopted by the United Mine Workers of the Panther Creek Valley at their annual convention. The men want the compensation law changed so that payments will start on the first day after injury instead of 14th, that the amount of compensation be increased from one-half to two-thirds of the injured's normal wages; that the period for payment on death be extended from 300 to 500 weeks, and that occupational diseases be brought under the total disability feature.

The miners call for a probe of the hospital by the trustees and are prepared to take their contention before the Governor.

Acetylene Is Banned

The Chief of the Department of Mines, James E. Roderick, has notified the mine inspectors of the anthracite and bituminous regions, that when pillar or any other work is being done in nongaseous mines, where the ventilation is partly destroyed, to notify the mine foreman that no lamps except a safety lamp or a common oil lamp shall be used by any employee working at the removal of pillars, or in doing any other work in any section of a mine where carbonic-acid gas is liable to be encountered.

The inspectors are instructed that the mine foreman must see that this order is carried out because the use of acetylene lamps may cause the loss of life, as acetylene lamps will burn in foul atmosphere, such as will impair the health and might possibly destroy human life.

Rules of Uniform Procedure

Rules and procedure, governing appeals to the courts from decisions of the Workmen's Compensation Board, similar to the rules adopted by the Board of Judges of Philadelphia County, will be adopted by other common pleas courts of the state when these tribunals resume their sessions this fall. This action will assure uniform procedure throughout the Commonwealth.

Section 425 of the Workmen's Compensation Act provides that a notice of an appeal from a decision of the compensation board must be filed with the prothonotary of the common pleas court having jurisdiction within 10 days after notice of the board's decision.

The Philadelphia courts in July adopted rules directing the prothonotary to call upon the Workmen's Compensation Board for an entire record of a case in which the appeal has been taken and the prothonotary is further directed to obtain these records by writ, mailed to the Bureau of Workmen's Compensation at Harrisburg, with a copy of the exceptions.

Chairman Mackey of the Compensation Board, has submitted the rules adopted by the Philadelphia courts to the other common pleas tribunals in the state and among the judges who have already announced their intention to adopt the Philadelpia court rules so that the practice may become uniform throughout the state, are Laird H. Barber, Maunch Chunk; G. G. Sloan, Clarion; Henry A. Fuller, Wilkes-Barre; Albert M. Johnson, Lewisburg; G. A. Endlich, Reading; Donald P. McPherson, Gettysburg; William C. Ryan,

Doyleston; S. P. Sadler, Carlisle; H. W. Whitehead, Williamsport; C. E. Terry, Tunkhannock, and W. Maxwell, Towanda.

A Discussion on Industrial Insurance

A conference to discuss the merits of state insurance, at which the Pennsylvania Workmen's Compensation Board will be represented, will be held in Washington, D. C., from Nov. 13 to 17, under the auspices of the International Association of Industrial Accident Boards and Commissions.

Those phases of social insurance to be considered will include workmen's accident compensation, together with sickness, old age and disability and unemployment insurance. The proceedings of the conference will be published by the United States Bureau of Labor Statistics in advance of the meetings of the various legislatures in 1917 so that these bodies may know the sentiment of the conference.

A comparison of the different forms of administration for workmen's compensation will be made at the opening session, followed by a comparison of the different methods of carrying workmen's compensation insurance. Some time will be devoted to a discussion of what are called discrepancies in the present workmen's compensation laws. Awards under such laws compared with settlements under liability laws and the troublesome question of how far lump-sum settlements are consistent with the principles of workmen's compensation laws will be considered.

Medical service and hospital fees, physical examination of employees, better accident statistics and measuring the degree of permanent disability form additions topics.

Comparison of the number of wage earners affected, sick benefits and medical service provided and the cost of the same in such existing agencies as trade unions, establishment funds, mutual benefit funds and sickness insurance organizations; the essential features of an adequate system of state sickness insurance, its probable cost and the methods of incorporating existing systems into a state system of sickness insurance will be taken up.

The need of a state system of invalidity and old-age insurance, the essential features of such state system and a discussion of provisions to be made in such case for existing agencies, with the additional topics of widows' and orphans' insurance and mothers' pensions is to be discussed.

The closing day of the session, it is said, will be devoted to methods of regularizing industry to reduce unemployment, methods of reducing the labor turnover, the organization of employment bureaus, existing agencies for unemployment insurance and a practical system of unemployment insurance.

With the Pennsylvania workmen's compensation act in force less than a year, and those of other states not much older, it is hoped in this conference to sum up the weakness of the various acts and prescribe from the knowledge of the entire country remedies for those defects, permitting each legislature then to act as it sees fit in its struggle to perfect these humanitarian statutes.

PENNSYLVANIA

Anthracite

Miners Mills—Six employees at the Pine Ridge colliery of the Delaware & Hudson Co. narrowly escaped suffocation in their chambers on Aug. 26, when overcome by black damp. Company physicians succeeded in reviving four of the men who were able to walk home, but the other two were taken to their homes in the company ambulance. They are in a serious condition. This is the first time the presence of black damp has been detected in the Pine Ridge and it caused much uneasiness among the other men working in nearby chambers.

Dunmore—Tests of the weights of mine cars and their contents may be made in the near future by the defendants as the result of a short session before the court in a suit brought by the Miles heirs against the Pennsylvania Coal Co. and others for royalties. The coal company objects to individual tests of weights being made but agreed to allow the weights to be taken providing they did not interfere with the operation of the collieries in question.

Wilkes-Barre—Four damage suits were started in the courts recently involving a total of $60,000. Helen Hricko wants $15,000 from the Lehigh Valley Coal Co. for the death of her husband, who was killed in No. 40 mine by a gas explosion. John Washidovich asks $10,000 from Coxe Bros. & Co., Inc., for the death of his son, a doortender in the Deringer mine, who was killed while at work. Joseph Czolono, by his next friend, John Tourishin, wants $15,000 damages from A. Pardee Coal Co. for injurines sustained while at work in the mines that caused amputation of his leg. Charles Charnetski, administrator of the estate of Paulina Charnetski, asks $20,000 from the Miners Mills Coal Mining Co. No statement was filed as to the cause of action.

Hazleton—Large fissures recently appeared in the streets of Japan, on the G. B. Markle Coal Co. tract, and families living in the town prepared to move out quickly. The work of robbing pillars under the town is now in progress. Many tenants were ordered out a month ago in a section considered dangerous. Cellar walls have settled away, and the locality assumed a topsy-turvy appearance.

Olyphant—The Olyphant breaker of the Delaware & Hudson Co. is being reconstructed.

Carbondale—Repairs to the Coalbrook breaker of the Delaware & Hudson Co. are nearly finished, and it is expected that operations will be resumed within the next few weeks.

Bituminous

Beallsville—Considerable activity is anticipated in the vicinity of Beallsville. An important deal was recently concluded whereby the Vesta Coal Co. purchased the farm of George Richey for immediate possession. This company expects to put down a shaft, and if conditions warrant, it is probable that a town will be built for the miners. This is one of several extensions which this firm is making in the Washington County coal field.

Pittsburgh—The Bessemer Coal and Coke Co. is the reputed buyer of a large acreage of coal land lying in West Deer Township. The price involved is unnamed. This coal is said to be superior for the manufacture of byproduct coke, and it will be largely mined for this purpose.

Sligo—John C. Graham, owner of several coal mines, has introduced an innovation by the adoption of a bonus system of paying his workmen. Mr. Graham pays the highest union wages and adds $3 to his men's earnings when they make $60 for two weeks' work. He wishes to increase the output of his mines in order to take advantage of the high price of coal and is willing to share the profit with his men providing they work accordingly.

Marion Center—A virgin field of coal will be opened within the next three months by Dr. W. S. Blaisdell, of Punxsutawney. The new site is located on the Wetzel farm, and it is expected that the first coal will be shipped during the early part of October. The opening has been delayed on account of the difficulty in securing workmen, but this has been overcome. A power house is being erected and most of the workmen's houses have been built. A railroad spur is being built from the main line of the Buffalo, Rochester & Pittsburgh R.R.

WEST VIRGINIA

Huntington—Preparations to continue the fight against the rail rate raise in west-bound coal from this state were continued at a conference held recently by Col. Z. T. Vincent, chief counsel for the West Virginia Coal Association. S. B. Avis, of Charleston, representing the Public Service Commission; W. H. Cunningham, secretary of the Coal Association, and attorneys F. B. Graham and James B. Francis, representing the Guyan Valley coal operators. Witnesses to go before the Interstate Commerce Commission were examined, and the general trend of the rate hearing discussed.

Stotesbury—The E. E. White Coal Co. recently completed an electric shop and installed the necessary equipment. This building now gives 4,200 sq.ft. of floor space for electrical repair work.

Welch—The operations in the Pocahontas field are still short of men, though they are turning out a larger tonnage than ever. It is as yet too early to determine what results, if any, may be expected from the advertising for men in which most of the companies united.

Fairmont—The companies in the Fairmont field, it is said, will shortly be more closely affiliated with the Splint and Gas Coal Association of the state. A meeting of their own association will be held shortly to take up this matter.

Charleston—The reconstruction of the Cabin Creek district has begun. The coal companies, damaged in the recent flood, working in coöperation with the Chesapeake & Ohio Railroad Co., have begun the rehabilitation of the devastated districts. The work is being conducted at an enormous cost; but when completed, the region will be bigger and better than ever before. Immediately after the flood, notices were posted in the company stores offering work at good wages to those left destitute. Many of the men took advantage of this offer. They were divided into gangs, and put under the direct supervision of company superintendents, working under general managers, Josiah Keely, of the Cabin Creek Consolidated Co., Charles Cabell, of the Carbon Fuel Co.; John Laing, of the Wyatt Coal Co., and others. Under this working system, order rapidly emerged from chaos, and work is now moving with surprising rapidity.

Montgomery—The New River Operators' Association, recently donated $1,000 to the relief of flood sufferers on Cabin Creek and Coal River, and in other sections of the devastated districts.

Ennis—Turkey Gap Coal and Coke Co. is beginning active development of the Pocahontas Nos. 9 and 11 seams of coal at the Turkey Gap colliery, to boost the output of the old mine in No. 3 seam, which is nearly worked out. No. 9 seam shows an average height of 70 in. over the greater part of the lease and this is supposed to be the best showing made by this seam in the Pocahontas field. No. 11 seam is 40 in. thick. A new incline and head house have been constructed and machinery is now being installed. This firm expects to ship coal from the new development by Sept. 15.

KENTUCKY

Whitesburg—Gorman will be the name of the new town to be built by the Elkhorn By-Product Coal Co. near Hemphill on Yount's Fork in Letcher Co., the construction of which was started some time ago. Jerry Gorman, formerly of Hazard, Ky., is manager.

OHIO

Crooksville—The tipple of No. 3 mine, of the Zanesville Coal Co., located one mile north of Crooksville, was totally destroyed by fire when struck by lightning recently. The loss to the coal company is estimated at $10,000, and 110 men are idle. Officers of the company announce rebuilding at once so as not to delay work in the mine longer than necessary.

Columbus—Operators say that unless there is a speedy relief of the car shortage the Northwest, which has been depending upon the Ohio and West Virginia soft coal fields for fuel, will face an acute shortage this winter. Even with only half the number of cars needed for the lake trade in sight, there is such a shortage of boats that many delays have occurred. Under ordinary circumstances ore boats have been used in hauling coal on the up trips, but so great is the rush to get iron ore down before the close of navigation that many of these boats have gone up light rather than be delayed at the docks waiting for full cargoes.

If an employee lose the sight of an eye through an accident and is paid real money in compensation therefor and then later, through a second accident, has the sight of that same eye restored, can he claim additional compensation? This is the peculiar case that has reached the state industrial commission. Several months ago George Taylor, of Murray City, while working in a mine of the New Pittsburg Coal Co., which carries its own compensation insurance, met with an accident which cost him the vision of one eye. The employers settled with him for the lump sum of $500. A few days ago Taylor went back to work and had only been on the job a short time when he was struck on the head by falling coal. He suffered injuries, but even greater benefits, for the bump restored the use of the injured eye. The state industrial commission is now called upon to determine whether or not Taylor shall be paid compensation for the second injury, which, although causing him much pain, was after all of greater benefit than it was harm.

INDIANA

Terre Haute—The Pittsburg Mining Co., of Terre Haute, was recently placed in the hands of a receiver, on the petition of William W. Ray, president of the company, who alleges that the firm has aggregate indebtedness of $100,000, which it is unable to meet. The United States Trust Co. was appointed received to continue the operation of the company until the assets can be disposed of advantageously. This firm owns 800 acres of coal land, and has two mines, one of which is in operation.

Clinton—The attention of the coal miners of the state will center on Clinton, Sept. 4 next, when the second annual Indiana state first-aid meet will be held. The town is making great preparations to entertain the miners and is going to much expense to make the affair a success. Indications point toward an unusually large meet, the number of teams already entered being larger than in the national meet held in Terre Haute in 1915, as well as the state meet held at Bicknell last year. During the morning there will be addresses by representatives from the Bureau of Mines, National Mine Workers, District No. 11, U. M. W. A., Indiana Coal Operators' Association and the State Industrial Board. The first-aid meet will take place in the afternoon which will be entirely devoted to that feature. Arrangements are being made to entertain the teams at supper. In the evening a social entertainment will be offered and the prizes presented. All members of teams entered will receive a medal and this year an innovation has been instituted by having the medals made up as silk watch fobs. Announcement of the other prizes will be made by the committee in the near future. The final event of the evening will be motion pictures of the mining industry. These are in six reels and are sent out by the Bureau of Mines.

ILLINOIS

Taylorville—The new coal shaft which was acquired by the Peabody interests from the Christian County Coal Co. about a year ago, is to be reopened. The seals have been broken and a current of air started through the workings. H. M. Young, general manager, made an examination and found that beyond a few falls the mine is in good condition and it will not take long to get it ready for hoisting coal. About 175 men will be employed. The plan of connecting the new and old mines has been abandoned. A new shaft will be sunk to the old mine. It is not expected that the old mine will be operated before next spring.

Belleville—The débris of the recent fire in the Eldnar Coal Co.'s mine has been cleared away. County Mine Inspector Thomas Wright and representatives of the liability insurance companies have inspected the mine and pronounced it ready for a resumption of work.

During a flood a few days ago Richland Creek broke through into an abandoned mine in the central part of the city. The fissure increased until it was almost an acre in extent. So far as has been learned no damage was done to any active mine workings.

Pana—Members of the Illinois United Mine Workers held a mass meeting here recently to protest against conditions at the Smith-Loehr mine, which they allege resulted in the killing of four men in an explosion a few months ago. At the time of the explosion the men contended that there should have been an examination to ascertain if gas was present before sending the miners below. The controversy has continued to this time. The meeting was addressed by Duncan McDonald, secretary-treasurer of the state organization.

Edwardsville—The New Staunton Coal Co., of Livingston, has filed an injunction petition in the Madison County Circuit Court against Louis C. Miller to restrain him from boring gas wells through the coal holdings of the company. The petition alleges that if gas wells are bored the lives of the miners will be endangered and property loss will be caused. Gas, it is alleged, would seep into the mine and there would be a risk of explosions. The outcome will be watched with interest by mine operators. If the decision in the Circuit Court is adverse the coal company will carry the case to the higher tribunals. The question has never been settled in the Illinois courts. The coal company owns coal rights under 78 acres where gas-well boring is threatened.

Springfield—Officials of the United Mine Workers say they have information that every coal mine in the immediate vicinity of Springfield and practically every mine in the central Illinois field will be working full time with a full force of men by Sept. 10. A recent visit of Francis Peabody, of Chicago, has given assurance that the Peabody mines will all soon be in operation.

Mrs. Jennie McKeown has filed suit in the Sangamon County Circuit Court against the Chicago-Springfield Coal Co. for $10,000 for the death of her husband, Frank McKeown, who was suffocated while at work as mine examiner for the company. It is alleged that negligence permitted the accumulation of gas.

MONTANA

Red Lodge—The mine buildings of the Smokeless and Sootless Coal Co. were recently destroyed by fire. The destruction of the buildings was complete, and only two smoke stacks were left in place, marking their original location.

Personals

W. C. Batson, mine foreman at the Benwood mine, has resigned.

Hugh Gaffney, former mine inspector of the State of Ohio, has resigned as superintendent of the Provident mine.

J. C. McKinley, a prominent coal operator and president of the West Virginia Mining Institute, is in Plattsburg, N. Y., for a month, to take military training.

Walter C. Smith, a civil and mining engineer with offices in the Board of Trade Building, Wheeling, W. Va., is at Plattsburg, N. Y., in the military training camp.

Richard Maize, formerly a mine inspector, and recently superintendent of the United Coal Co.'s plant at Jerome, Penn., has accepted the position of superintendent of the Quemahoning Coal Co.'s mine, at Ralpton, Penn.

Dr. John Hoskins, recently located at Pemberton, W. Va., has been appointed physician in charge of the medical practice of the Princewick and Lillybrook companies on Stone Coal Creek, W. Va.

D. S. Wolfe, assistant chief engineer of the Lehigh-Coxe division of the Lehigh Valley Coal Co., has been appointed superintendent of the Mahanoy and Schuylkill districts, with headquarters at Park Place, to succeed T. R. Jones, who resigned to become head of the Madeira-Hill operations.

James **F. Marsteller** was recently elected a member of the board of directors of the West Virginia Midland Collieries Co., and will act in the capacity of consulting engineer. Mr. Marsteller is well known in the bituminous coal industry, having been at one time general superintendent of the Pennsylvania Coal and Coke Corp., and more recently vice-president and general manager of the Rock Hill Coal and Iron Co.

Brooks Flowers, president of the Alabama convict bureau, left the service of the state Sept. 1. He will be succeeded by P. J. Rogers, of Birmingham, former head of the convict department. Mr. Rogers, prior to accepting the presidency of the convict bureau, was for many years superintendent of the Pratt coal-mine division of the Tennessee Coal, Iron and Railroad Co., and was also long a member of the State Mining Board.

Samuel J. Jennings, of Pittston, Penn., recently resigned as mine inspector of the 9th Anthracite District, to accept the position of general superintendent of the Delaware, Lackawanna & Western Railroad Co.'s coal department. Mr. Jennings had been a state mine inspector for about four years going to the state's employ from a position as mine inspector of the south division of the Pennsylvania, and Hillside Coal and Iron Co., where he had served for a number of years.

H. M. Taylor, A. R. Hamilton, H. M. Wilson, of Pittsburgh, James B. Neil, of Minersville, P. C. Madeira and Jasper L. Brinton, of Philadelphia, B. D. Coleman, of Lebanon, James Mathews, of Shamokin, John T. Dempsey, of Scranton, F. E. Waite, of DuBois, Thomas Kennedy, of Hazleton, and W. R. Crane, of State College, were recently appointed by Governor Brumbaugh, of Pennsylvania, as delegates to the 19th annual session of the American Mining Congress to be held at Chicago, Nov. 13 to 16. These men are operators, engineers and members of labor organizations.

Obituary

John L. Lawler, head of the firm of John L. Lawler & Son, coal operators at Minerton and Clarion, Ohio, died at his home in Columbus recently from a complication of diseases. He had been in failing health for more than two years.

John McCutcheon, mine foreman at No. 2 colliery of the Pennsylvania Coal Co., died on Aug. 24. Mr. McCutcheon had been ill for the last 18 mo. with diabetes but was able to attend to his duties until about a week before his death. He was born in Pittston, in 1880 and is survived by his wife and one son, also by his parents.

Col. Joseph H. Horton, who has conducted a general coal trade in Buffalo, N. Y., under his own name since retiring from the sales agency of the Lehigh Valley Coal Co. a dozen years ago, died on Aug. 13 from an attack of indigestion aggravated by heart disease. He leaves only one near relative, Mrs. Grosvenor R. Trowbridge, a daughter. Colonel Horton was a native of Pennsylvania and had a distinguished war record. He entered the Civil War as a lieutenant in the 141st Pennsylvania Infantry. At Gettysburg the officers of the regiment were killed or wounded till he, as a captain, had to take command. Promotion soon folowed and he was mustered out a lieutenant-colonel at the close of the war. He was at the head of the regiment at Lee's surender. At Spottsylvania Courthouse he was wounded. He was 74 years of age at the time of his death.

Catalogs Received

"Coal Shovels, Scoops, Etc." Baldwin Tool Works(Parkersburg, W. Va. Catalog and Price-List. Pp. 42. 9x12 in. Illustrated.

"Coal Briquetting Machinery and Plants." Mashek Engineering Co., 90 West St., New York. Catalog No. 4. Pp. 104. 8x10½ in. Illustrated. This also contains description of processes, binders and costs of manufacture.

"Suggestions for Retail Coal Dealers." Specialty Engineering Co., Allegheny and Trenton Ave., Philadelphia, Penn. Catalog No. 4. Pp. 48. 6x9 in. This illustrates and describes coal pockets, wagon loaders, car unloaders, screens, conveyors, chutes, etc., built by this company.

Recent Coal & Coke Patents

Smoke Consumer. C. W. Johns, Jerseyville, Ill. 1,189,959. Filed Feb. 17, 1913. Serial No. 748,964.

Miner's Electric Lamp. A. Toler, Berwind, Colo. 1,186,454, June 6, 1916. Filed Apr. 24, 1915. Serial No. 23,745.

Coke Oven. N. S. Westminster, London, Eng. 1,186,687, June 13, 1916. Filed Dec. 21, 1914. Serial No. 878,420.

Coal Car Cover. A. N. Fountain, Ashtabula, Ohio. 1,186,388, June 6, 1916. Filed Nov. 6, 1915. Serial No. 60,075.

Mechanical Stoker. J. P. Davis, Cincinnati, Ohio. 1,186,971, June 13, 1916. Filed May 6, 1915. Serial No. 26,296.

Coal Sampling Machine. L. L. Beeken, Pittsburgh, Penn. 1,186,646, June 13, 1916. Filed July 6, 1915. Serial No. 38,150.

Car Retaining Device for Mine Cages. G. M. Johnson, McDonald, Penn. 1,187,151, June 13, 1916. Filed Oct. 25, 1915. Serial No. 57,782.

Method of Carbonizing Coal and Obtaining Gas. H. L. Doherty, New York, N. Y. 1,187,050, June 13, 1916. Filed Nov. 15, 1911. Serial No. 660,451.

Support for Coal and Rock Drills. N. D. Levin, assignor to Jeffrey Manufacturing Co., Columbus, Ohio. 1,185,809, June 6, 1916. Filed July 28, 1914. Serial No. 853,769.

Continuous Weighing Apparatus. H. L. Merrick, assignor to Merrick Scale Manufacturing Co., Passaic, N. J. 1,186,218, June 6, 1916. Filed Nov. 24, 1913. Serial No. 802,597.

Process of Washing Coal and Separating Refuse Therefrom. N. Shannon, assignor to Link-Belt Co., Chicago, Ill. 1,190,960, July 11, 1916. Filed May 22, 1908. Serial No. 434,328.

Industrial News

Vincennes, Ind.—The Oliphant-Johnson Coal Co. recently increased its capitalization to $75,000.

Columbus, Ohio—The Perry County Coal Co. recently decreased its capitalization from $200,000 to $2,000.

Joliet, Ill.—The Powdered Coal Engineering and Equipment Co. is planning to build a plant to cost approximately $225,000.

East Bernstadt, Ky.—The McCarthy Coal Co. has been incorporated with $1,500 capital by John McCarthy, Fred Blunschi and John Blunschi.

Buffalo, N. Y.—The Lehigh Valley R.R. has started its new McMyler car-dumping machine at its anthracite dock located at Tiffs Farm, Buffalo, N. Y.

Birmingham, Ala.—The Gulf States Steel Co., James Brown, president, has appropriated $1,500,000 for the erection of a byproduct coke plant in the Birmingham district.

Oklahoma City, Okla.—The Adamson Coal Co., of Pierre, S. D., has been granted a permit to do business in Oklahoma. Headquarters will be maintained at Oklahoma City.

Carbon Hill, Ohio—The Joyce Coal Co. has been organized at Carbon Hill with a capital of $5,000. The incorporators are William, Charles, J. H. and C. E. Joyce, and J. H. Briggs.

Weeksbury, Ky.—The Milwaukee Gas Coal Mining Co. is starting work on 150 additional miners' houses here and the opening of two additional mines. Other extensions are to be made.

Adamson, Okla.—The Adamson Coal Co. was recently incorporated by Fred C. Russel, R. T. Brewer, of McAlester, J. H. Baker, G. A. Reidt, of Hartshorne. The capital stock is $100,000.

Mullens, W. Va.—Contract for an apron feeder, screens, picking table and loading equipment for the Smith-Pocahontas Coal Co. was awarded recently to the Fairmont Mining Machinery Co.

Seco, Ky.—The South East Coal Co., H. La Viers, general manager, recently awarded a contract for head-house equipment and a retarding conveyor to the Fairmont Mining Machinery Co.

La Viers, Ky.—The South East Coal Co. (post-office Seco, Ky.), will acquire additional coal land and will start additional developments of its property within the next few weeks. H. La Viers is manager.

Hazard, Ky.—The Kenmont Coal Co., recently organized, has awarded a contract for a head-house equipment and a 900-ft. retarding conveyor to the Fairmont Mining Machinery Co., of Fairmont, W. Va.

Kittanning, Penn.—The Mohawk Coal Co. recently awarded a contract for shaker screens, picking table, loading boom, nut, slack and refuse conveyor to the Fairmont Mining Machinery Co., of Fairmont, W. Va.

Philadelphia, Penn.—The Philadelphia & Reading Ry. has closed a contract for the construction of 10 barges, which will be added to the fleet in the coal-carrying trade between this port and New England points.

Logan, W. Va.—A deal was recently consummated, it is alleged, whereby the operations of the E. A. Anthony Coal Co., at Omar, passed into the possession of the Island Creek Coal Co. No details have yet been divulged.

Kewaunee, Ky.—The Kewaunee Coal Co. has been purchased by J. B. Rodgers, of Cincinnati. Mr. Rodgers will soon begin improvements and will make some extensions in the plant. New mines will be opened, it is said.

Pittsburgh, Penn.—The Champion Gas Coal Co. of Pittsburgh, was recently organized with a capital stock of $50,000. The incorporators are Charles F. Bygate, of Pittsburgh, J. F. Kurtz, of Connellsville, and H. A. Davis, of Washington, Penn.

Kincaid, Ill.—Ground has been broken for the new Peabody foundry here, which is expected to be finished by the first of the year. At first the chief product of the foundry will be small mine cars. Later, mining machines may be manufactured.

Nanty-Glo, Penn.—The Roberts & Schaefer Co., Chicago, has secured contract recently from the Lincoln Coal Co., of New York City, for the building of a complete electrically operated Marcus patent coal tipple for installation at Nanty-Glo, Penn.

Charleston, W. Va.—The Harry T. Jones & Sons Co. was recently incorporated with a capital

stock of $50,000 for the purpose of doing a general coal-mining business. The incorporators are Harry G. Jones, of Comfort, W. Va., and four others.

Coalport, Penn.—The Roberts & Schaefer Co. recently secured an order from the Cambria Smokeless Coal Co. for the installation of a Marcus patent picking table screen in an existing coal tipple, which will be remodeled immediately at Coalport, Penn.

Birmingham, Ala.—The Suspension Board of the Interstate Commerce Commission has under consideration the suspension of the proposed increase of $2 per ton on coke and coal to Pacific Coast points, which the railroads proposed to put into effect Sept. 1.

St. Louis, Mo.—Miss Emilie M. Cabanne, a debutante of last season, has entered commercial life as a coal saleswoman. She is working for the Edward Devoy Coal Co. on a commission basis. She has been at this unique avocation for three weeks and is making good.

Pittsburgh, Penn.—The Safety First Supplies Co. recently doubled its floor space in the Hartje Bldg., and now has one of the most complete show rooms of its kind in the United States. H. B. Lacey is president, and H. W. Dinker is treasurer of this company.

Ironton, Ohio—William Compliment has purchased of Andrew Guile 50 acres of coal land near Coal Grove, and is making preparations to open a mine on it. He has been in the retail coal business for some years, but has not heretofore been interested in any operation.

Beaverdale, Penn.—The Pennsylvania Coal and Coke Corporation has awarded contracts to the Roberts & Schaefer Co. for two 3-track, electrically operated, Marcus patent coal tipples; one to be built immediately at Winburne, Penn., and the other at the mine at Beaverdale, Penn.

Philadelphia, Penn.—The barge "Westmoreland," built for the Pennsylvania Gas Coal Co., at Bath, Maine, was launched recently. The craft has a capacity of 2,400 tons and will be placed in the coastwise trade. Another barge of the same capacity is now under construction.

Logan, W. Va.—The Main Island Creek Coal Co., John Laing, president, will shortly open five additional mines on its lease on Main Island Creek. The new development will include the construction of new tipples, stores and houses. Two miles of railroad will also be constructed.

Paducah, Ky.—The Kentucky Railroad Commission will give a hearing to the petition of the Paducah Board of Trade for lower rates on coal from western Kentucky over the Illinois Central. A rate of 65c. on all coal east of Nortonville to Paducah and 50c. on all coal west of that point is sought.

Birmingham, Ala.—The Interstate Commerce Commision has declined to grant the petition of Alabama coal operators for readjustment of freight rates from Alabama, Illinois and western Kentucky territory to Memphis and vicinity, which Alabama operators claimed were discriminatory and hurtful to the Alabama coal interests.

New York, N. Y.—The Hartmann-Blanchard Co., Inc., was recently organized by W. Hartmann and C. N. Blanchard, a coal operator of Binghamton, N. Y. The purpose of this firm is the wholesale distribution of anthracite and bituminous coal. The offices will be at 50 Church St., New York.

Moosic, Penn.—The Minooka Coal Co. has filed with the clerk of the United States Court a schedule showing its assets and liabilities. The company was thrown into bankruptcy some time ago. According to the schedule signed by the treasurer of the company, liabilities are $159,604.19, while assets are $38,193.67.

Washington, D. C.—The American Chamber of Mines was recently incorporated, Francis B. Nicholas, Charles W. Henderson, William N. Slater, Clarence Lewis and Thomas G. Lewis being trustees. The object of the incorporation is to furnish news and information concerning mines to prospective investors.

Russelton, Penn.—The building of a new town about three-quarters of a mile south of Russelton is predicted, as the result of the sinking of a mine shaft on the Fryer farm by the Bessemer Coal and Coke Co. The average monthly payroll of the new mine will be about $40,000. The company will construct 125 houses for its employees.

Kanawha Falls, W. Va.—The Kilbourne & Jacobs Mfg. Co., of Columbus, Ohio, has for sale the coal rights (or the land) on property from which it has been cutting timber. This consists of 2,200 acres of land, with a coal area of 500 acres, estimated to contain 8,000,000 tons of coal in seams 3 ft. and 5½ ft. thick.

Fayetteville, W. Va.—It is reported that the Hartland Colliery Co. has purchased 15,000 acres of coal land on the Coal and Coke R.R., in Clay County, West Virginia, which it intends to develop after the construction of 22 mi. of railroad through the tract to connect it with the Chesapeake & Ohio R.R. The deal is said to involve $500,000.

Blakely, Penn.—Counsel for the owners of the Lillibridge coal lands have begun action in equity against the Lackawanna Coal Co., Ltd., to recover royalties and interest totalling $346,414.97. They ask that the original agreement made in 1883 and a supplemental agreement of 1891 be canceled, now that the defendant has taken all the minable coal.

Lonaconing, Md.—Hoffa & Sons, formerly of Pennsylvania, but who have been operating at Barton for several years, have leased the entire holdings of the American Coal Co. in this section, and will at once proceed with extensive developments. After a period of nine years of idleness, it is estimated that shipments will be resumed from the plant of the American Coal Co. by the middle of September.

Clarksburg, W. Va.—Announcement was recently made of the immediate action to be taken by the Hartland Colliery Co. toward the development of its large tract of coal property in Braxton and Clay Counties. Ten of its mines are to be opened on Middle Creek in Clay County as soon as the work can be executed; but in order to accomplish this object, six miles of railroad will be started immediately.

Charleston, W. Va.—The announcement of the purchase of the Kanawha & West Virginia R.R. by the Kanawha & Michigan has aroused considerable interest among coal operators. The line extends from Charleston up the Blue Valley a distance of about 25 mi. It is announced that the line will be extended by the purchasing company, opening up a large coal area.

Columbus, Ohio—The Southern Ohio Coal Exchange was in charge of an exhibit, boosting Ohio-mined coal at the Ohio state fair, held in Columbus, Aug. 28 to Sept. 2. The exhibit consisted of samples of coal mined in several districts, together with literature showing why Ohio coal should be purchased by residents of the state. The display attracted considerable attention.

San Francisco, Calif—The Crocker-Wheeler Co., Ampere, N. J., announces that its San Francisco district office, W. K. Brown, district manager, has been removed from the Crossley Building, 619 Mission St., to the ground floor of 87 New Montgomery St. A large assortment of motors, generators and transformers will be carried in stock for the convenience of buyers of electrical equipment on the Pacific Coast.

Fairmont, W. Va.—The Fairmont Mining Machinery Co. recently announced that it had completed the plans for the enlargement of its plant. The present plant employs 300 men. This will be increased by 100 more. The large number of orders ahead made it imperative that the plant be increased. Contracts for the buildings and equipment will at once be let, and the work will be started as soon as possible.

Columbus, Ohio—The Southern Ohio Coal Exchange is coöperating with similar organizations in Cleveland, Cincinnati, Detroit and Pittsburgh in making a fight to change the percentage of depreciation allowable on coal properties in the revenue bill now pending in Congress. As the bill passed the House of Representatives it only allowed 5 per cent. depreciation but coal interests want this raised to 10 per cent.

Philadelphia, Penn.—A majority of the retail coal men, it is reported, are preparing to place before the Gawthrop commission statistics relating to the cost of handling anthracite when the commission begins the investigation for which it was appointed by Governor Brumbaugh. It is understood the chairman of the commission has been in correspondence with a number of the local retailers in regard to information desired.

St. Louis, Mo.—The St. Louis East Side Belt Terminal Ry., which has leased the Southern Traction Co. properties from the receivers, announces that it will begin hauling coal this fall to East St. Louis. As soon as the Municipal Bridge is completed coal will be hauled across the river to St. Louis. The receivers have petitioned the Illinois Public Utilities Commission to approve the lease, which is for three years.

Youngstown, Ohio—The Youngstown Sheet and Tube Co. has begun operations at its new benzol plant, following the operation of its 102 coke ovens, which furnish byproducts for the operation of the benzol plant. An additional battery of the same number of ovens is to be started soon, furnishing additional material for byproduct operations. The Barrett Manufacturing Co. is constructing a plant to handle the tar byproducts.

Wheelright, Ky. (post-office Weeksbury, Ky.)—The Elk Horn Mining Corporation has started work on a new town here to be known as Wheelright, in honor of Jere H. Wheelright, one of the leading stockholders of the company. Several mines are to be opened and large sums will be expended in the work. Hundreds of buildings will be erected. The company plans the development fo 5,000 acres of valuable coal lands.

Fairpoint, Ohio—The Fairpoint & West Virginia Coal Co., with mines at Fairpoint and Edgewood, has started work on a new mine at Rush Run, which, when operating full, will employ between 400 and 500 men. The opening has already been started, and modern machinery will be employed. It is also said that another mine may be started in the near future to assist in the development of the property. The company will erect 50 or more houses.

Brownsville, Penn.—It is reported that F. J. Foye, of South Brownsville, has received a contract for sinking three concrete-lined shafts for the Ebensburg Coal Co. These shafts will be 400 ft. deep, and will cost in the neighborhood of $125,000. Ground will be broken for the new shafts early in September. The contract calls for the completion of these shafts within ten months after they are started. They will reach the lower Kittanning bed of coal.

Pittsburgh, Penn.—The coal and coke carried on the Pennsylvania Railroad Co.'s lines east of Pittsburgh for the month ending July 31 included 906,509 tons of anthracite, 4,014,712 tons of bituminous coal, and 1,156,559 tons of coke. This gave a total of 6,077,780 tons, being a total increase of 663,170 tons. From Jan. 1 to July 31, inclusive, the road carried 6,766,550 tons of anthracite, 8,508,352 tons of coke, and 43,558,751 tons of bituminous coal.

Pittsburgh, Penn.—Blum, Weldin & Co. recently acquired all plans, notes and other records from the office of Hudson F. Layton, civil engineer of Pittsburgh, who is retiring from independent practice. The addition of this large amount of data covering the practice of Mr. Layton, and of the firm of Browne & Layton for the past 13 years, greatly increases the facilities of the above firm for service, particularly in the matter of surveys in the city of Pittsburgh and vicinity.

Edwardsville, Ill.—A compilation of statistics shows that 21,900,493 tons of coal were mined in Madison County during the past six years, there having been an average annual increase in output of 100,000 tons. Sixty-eight coal miners lost their lives, and 575 were injured to such an extent that they lost a month or more of work. One life was lost for each 322,066 tons of coal produced, while 261,989 kegs of powder were employed to blast down the production of the county.

Scranton, Penn.—The Scranton Coal Co. was granted a temporary restraining order by Judge K. M. Landis, of the Federal Court, at Chicago, preventing the Great Lakes & St. Lawrence Transportation Co. from selling its fleet of ships to the French Government. The coal company alleges that it has a three-year contract with the transportation company beginning last spring by which the boat company agreed to use its vessels to ship 400,000 tons of coal annually to Duluth, Chicago and Milwaukee.

Charleston, W. Va.—Although the shipment of coal on the Norfolk & Western R R. for the month of July was 204,705 tons less than that for the month of June, the coal tonnage handled by that road for the first seven months of the present year was 314,000 tons greater than during the entire year of 1911. During July this road handled 2,841,495 tons of coal, while for the first seven months of the present year an increase of 4,175,881 tons is shown over the corresponding period of last year.

Cincinnati, Ohio—Following the failure of attempts to adjust differences between the People's Coal Co. and the Marmet Coal Co. in the litigation between them, the People's company has obtained execution upon a judgment awarded it against the Marmet company some time ago, for the sum of $12,000, claimed to be due on a contract for coal barges. Appraisers will set aside enough of the Marmet property available in this vicinity to satisfy the execution, unless legal steps are taken to postpone such action.

Baltimore, Md.—G. W. Atkinson and W. R. Iaeger, receivers of the Davy-Jocahontas Coal Co., 804 Maryland Trust Bldg., Baltimore, will shortly offer at public sale in fee simple over 4,000 acres of Pocahontas coal land with complete mining plant and two drift mines in operation in McDowell County, W. Va. This property is bounded on two sides by the Norfolk & Western R.R., and is adjacent to mining plants already developed. Analysis of the coal, description, the date set for sale and full particulars will be sent on application to the receivers.

Springfield, Ill.—The opposition of the Kansas and Missouri operators to the new freight rate of $1.25 per ton on shipments of fine coal between Springfield, Ill., and Kansas City via the Chicago & Alton R.R., effective Aug. 24, is vigorous and persistent. The Kansas City operators appealed to the Interstate Commerce Commission for an order to suspend the rate. The Commission held a four days' hearing at Washington, D. C., at which the Kansas City and Springfield coal men testified, and at the end of the hearing took no action to restrain the rate. It is not expected that there will be any drastic action on the part of the Commission. It may review the case later, but the Springfield operators are confident that the rate will remain in effect. A number of contracts in Kansas City have been withheld pending the outcome of this case. The municipal plants at Kansas City, Kan., have been buying 300 to 400 tons of coal per month, and the commissioner of these plants has stated that his contracts will be withheld pending the outcome of the case. In the meantime he is buying coal in the open market to meet his requirements. Several other contracts, large and small, are held in abeyance for the same reason.

Market Department

GENERAL REVIEW

Railroad strike possibility the dominating feature. Advance to the full winter anthracite circular and buying still active. Bituminous shippers running behind on contracts. Lake movement unsatisfactory. Consumption in Middle West at maximum rate.

Railroad Strike Outlook—All interest at the moment centers on the apparent deadlock over the railroad labor controversy. Operating officials appear confident of being able to maintain fairly regular schedules, but there is no doubt that the movement of bulk commodities, such as coal, will be the first to feel the pinch resulting from any interruption to transportation facilities.

Anthracite—Direct evidence of the excellent condition of the trade is seen in the independent attitude of selling interests, and the equally less critical position of the buyers concerning the advanced prices of the year. The increase in the circulars to the full winter schedules, effective yesterday, stimulated a flood of last-minute buying, a great deal of which will have to be carried over into the current month. Stove coal continues the leading size, and it is doubtful if all the orders for this month will be filled. Production in the mining regions continues to be interrupted by incipient strikes, and there is much complaint about the general indifference of miners to working. The railroad embargoes were practically all cleared up for a time during the past week, but further tentative embargoes were declared to become effective in event of a strike.

Bituminous—The general awakening to the fact that outputs are going to be more or less restricted throughout the season is stimulating more buying all the time. Free coal is so scarce that the margin between this and the contract basis has heached a point where buyers will not go into the spot market unless absolutely forced to. The shortage in the car and labor supply is making it impossible for consumers to accumulate any surplus, while many of the better grades of fuel are entirely out of the market. A good many shippers are running a full month behind on their contract quotas. Railroads are pressing their shippers for all the coal they can possibly get although this is apparently for stocking purposes, since there is no immediate need for extra shipments. The scarcity of vessel tonnage is forcing some Tidewater buyers into the all-rail market. Exports continue in a satisfactory volume, and delays in British shipments from various causes are helping the situation in this country. Stocks at the piers are relatively small, though export shippers have so far experienced no difficulty in filling out cargoes.

Lake Market—The demand continues persistent and there is considerable inquiry for delivery over the next 30 to 60 days, but operators are hesitating about quoting, due to the uncertainty concerning transportation facilities. The flood damage in West Virginia was apparently of greater proportions than anticipated, and it is now developing that some mines will not be able to resume shipment before Oct. 1, while a few may be delayed even longer. The cutting off of this tonnage at a crucial time like the present has stiffened the market up appreciably, as a great many of the Middle Western consumers of Kentucky and West Virginia coal are now buying from Ohio to keep running. Car and labor stortages are also becoming more pronounced as the season advances.

Middle Western—Consumption in this section is outstripping all previous records, and the trade has never before been on a more profitable basis, while the producing interests are convinced that further decisive advances will occur when the fall trade opens up. The shortage is being further accentuated by urgent requests from large consuming interests who are attempting to accumulate reserve stocks. Practically all the operators were entirely sold up over the closing period of August, while a great many are well covered for the larger part of the current month, and some have announced that the new prices, effective on the first, are subject to withdrawal by the middle of the month. In the retail trade, dealers who have been withholding orders in anticipation of lower prices, are now being forced into the market and are conducting their negotiations under difficulties. The shortage at the upper Lake ports will be relieved in a measure by the poor crops which will have a tendency to restrict consumption.

A Year Ago—Tendency to hold closer to the circular in the anthracite trade. Incipient car shortage developing in the bituminous region. Deadlock in British labor negotiations creates renewed interest in export trade. Reports generally more optimistic.

MARKET OPINIONS

The current market situation, as viewed by some of the leading companies, is:

Brothers Valley Coal Co., New York (by J. M. Leonard)—The current market is good, and the outlook very good. Prompt and contract movement are both heavy. Prices in both the spot and contract market rule about 30c. to 50c. per ton above last year's level. Car and labor supply are short.

Dickson & Eddy Co., New York (by J. B. Dickson)—The current market is very good, and indications point to a great scarcity of coal in the near future. There is a fair movement both on contracts and prompt. Very little price cutting is noticed.

Geo. M. Dexter, New York—The current market is strong, and indications point to higher prices, though both the prompt and contract movement are poor. Quotations already rule above the level at this time last year, and indications are that they will be 50c. higher than at present by Jan. 1, due to the poor movement, car and labor shortages, the latter being very serious.

General Manager of Sales (large operating and sales company), New York—There is a very strong demand, with very little spot coal offered. Men and cars are scarce, and the situation will probably get worse. The spot demand is active, with very little coal offered, and contract buyers are urging maximum quotas on their contracts. Spot prices on steam coal are about the same as last year. Gas coals are higher, and contracts are being renewed at 25c. or more per ton above last year's level.

Sales Manager (large operating and sales company), South Carolina—The current trade is entirely favorable, shows an upward tendency with good indications for a strong market this fall and winter. The prompt movement is very good. Practically all consumers in this territory are covered with contracts. Both spot and contract prices are much higher than a year ago. The floods and washouts have put the railroads in this section out of commission for about a month, and consumers in our territory have practically no stocks. There is a pronounced shortage of gas coal at Lamberts Point. As a result of these conditions supplemented by an acute shortage of labor, we expect to see the tightest coal market this fall and winter we have ever experienced.

Commercial Coal Co., Washington, D. C. (by Fred Dixon, Jr., Manager)—The situation is very uncertain because of the scarcity of labor and difficulties in the mining regions. Prices will advance this winter. Conditions will improve as the men return to work. Both the contract and prompt movements are very slow. Prices rule from 25 to 40c. per ton above this time last year. The scarcity will be felt for the next six months as the mines are only producing 60% of their normal tonnage though conditions turn largely on the labor supply.

J. K. Dering Coal Co., Chicago (by J. K. Dering, President)—This company reports the best market in 25 years with more business than they can possibly take care of. The prompt movement is not very heavy and on contracts they are shipping all the coal they can obtain cars to load. Prices on both spot and contract are very much better than a year ago. Screenings, which ordinarily sell in this market at 50% off contract figure at this time, are now selling at a premium of 5 to 15c. per ton. They expect to have the greatest difficulty in taking care of their business, due to the combination of car and labor shortages. Never in their experience have cars been so scarce, with the possible exception of in midwinter, and indications are now that they will not be able to operate their mines more than three days per week.

National Coal and Coke Co., Birmingham, Ala. (by R. T. Daniel, Mgr.)—The market is very good and apparently limited only by the car supply. The outlook is good, the prompt movement steady and the contract movement above normal for the season and much better than last year. Prices range from 5 to 25c. per ton above last season. The market has shown much activity during the past 30 days, while the car shortage has become more and more acute and indications are that the early fall will find many retail dealers with practically no coal on hand. Some orders entered during June and July for prompt shipment are still unfilled, due to the lack of equipment. Most of the mines in this section have been turning down new business for the past two weeks until they can catch up on back orders.

BUSINESS OPINIONS

Iron Age—The 1916 naval program will make a far greater demand on steel works than had been calculated. It is now figured that for hulls and armament 215,000 to 220,000 tons will be needed for the four battleships, four battleship cruisers, four scout cruisers, twenty destroyers, twenty submarines, one fuel ship, one ammunition ship, and one hospital ship. In the case of two steel companies, at least, some of this Government work must be taken on to the exclusion of more remunerative foreign orders. New vessel orders include three on the Pacific Coast, two at Philadelphia for American owners, and two at Baltimore for Norwegian interests. Steel placed for these is mainly for the third quarter of 1917. An Eastern yard has just placed 40,000 tons of shipbuilding steel, chiefly plates. Japan is still a buyer for its shipyards, and its wants make up the bulk of a 20,000-ton inquiry pending in the Chicago district.

Boston News Bureau—The general situation remains tense. It is almost unbelievable that the threatened strike of such huge proportions and capable of such disaster will actually take place. But it may require an actual showdown to force a settlement. A complete tie-up of the transportation industry is improbable. People generally are maintaining their equilibrium. They realize that the situation is one calling for coolness and deliberation. We are in a crisis and should exhibit self control. It is not as if the railroad trainmen were underpaid. The fact is that they believe they can continue to hold up the railroads by threats of a strike. The time has arrived when capital must assert itself. A strike now would fall more heavily upon labor than upon capital. Aside from the labor question the outlook is favorable from many points of view. General trade is active and promising.

American Wool and Cotton Reporter—More business and more inquiries in the wool market have characterized the week under review with sales of 3,900,000 pounds. Manufacturers are looking about more and will continue to do so as time goes on in preparation for the heavy weight season. Dealers are looking for a large business this fall. A prominent feature of the market during the week was the interest in delaines which are selling on a reasonable basis. Staple territory wools seem to be a little disappointing this year.

Dun—Various influences, most of them temporary, have caused some recession in the volume of business. Production and distribution have both been lessened appreciably by oppressive heat over a wide area, while in some industries the necessity of repairs has become imperative and in others belated inventories are being taken. Operations at many of the works are also hindered by the scarcity of raw materials and shortage of labor, and the high prices and generally sold-up condition of mills and factories naturally tend to restrict buying. Commercial failures this week in the United States, are 273 against 352 last week, 275 the preceding week, and 321 the corresponding week last year.

Bradstreet—Trade and industry are active, prices of nearly all products are firm or advancing, and reflection of the undeniably poor general crop situation or of the uncertain railroad outlook is sought, almost in vain, in the reports as to trade demand, manufacturing activity or commercial collections. This is attributed to various causes, least of all, however, to exaggeration as to crop damage, though there is probably some of this to be reckoned with.

Dry Goods Economist—All kinds of raw materials continue high, with no immediate prospect of a recession. Cotton gained strength this week on the publication of the Government's weather report, which showed injury to the plants in a number of sections. Manufacturers of textiles are further hampered by the labor conditions. While operatives are receiving higher wages than were ever dreamed of, their efficiency is, if anything, below normal and, though many mills offer a premium for greater production, the net increase in output is very limited.

Marshall Field & Co.—Wholesale shipments of dry goods for the current week show a good increase over the same period of last year. The total volume of road sales is continuing to run ahead of the corresponding week in 1915. Notwithstanding the splendid future business which has been booked, wholesalers are gratified at the very heavy volume of house sales made throughout the market season. Collections for the week have been above normal. The market on domestic cotton goods is strong with an upward tendency.

Atlantic Seaboard

BOSTON

Prices on Hampton Roads coals strong, but few spot sales reported. Receipts less than normal, and increasing anxiety among consumers. Georges Creek available only in small tonnages on contract. Pennsylvania shippers conservative as to futures. Anthracite shipments very slow.

Bituminous—The week has shown very little change in the situation of the smokeless coals. Quotations are strong at $3.40@3.50 on Pocahontas and New River, but not so much because of actual spot sales at those figures as because shippers realize the output is going to be more or less curtailed the balance of the year and wish to trim their sales accordingly. The export demand is constant and a large volume of coal continues to be loaded for that trade. Dispatch has improved somewhat so that two to three days is now about the average detention. The agencies, however, show the same caution about accepting boats. Coastwise cargoes are being limited practically to transportation regularly arriving on contract, although carriers ordinarily loading at Baltimore are again applying for coal at Hampton Roads. At this writing there are no signs whatever of weakness in the West Virginia coals for several months to come.

While more than a few buyers in New England are short of coal, considering the stocks normally on hand Sept. 1, there is as yet no active spot market for coal on a delivered basis. Various prices are rumored, but actual sales are scarce. None of the factors are as yet able to get cargoes afloat on any basis that will permit speculation at the moment, and the margin between contract coal and coal "on the market" is so great that buyers will not enter the spot market until they are absolutely obliged to. For the most part the shippers are making deliveries on the average a month behind the usual quota at this time, and as long as contracts are being filled in such proportion there is not likely to be a really panic market, unless new conditions enter into the situation.

Distributors to points inland are close-hauled on deliveries. Cars are in poor supply and arrivals are well behind schedule. At the same time purchases at current prices are only for small quantities. Few of the shippers have any free coal, so insistent is the contract demand for it.

The Georges Creek shippers are getting farther and farther behind on deliveries. Practically all of their coastwise barge transportation has been diverted to Hampton Roads or elsewhere because they are so short of coal at Baltimore. At Philadelphia and New York there is practically none of this grade available. There is certain to be a serious shortage of it in this territory.

While many of the Pennsylvania operators have all the business they care to undertake for the present, others are selling conservatively at ruling prices. Sales are being made at $2@2.25, depending on quality, for deliveries from now to Apr. 1. The same prices prevail among other shippers on deliveries only to Jan. 1. The demand is increasing all-rail, particularly from consumers ordinarily depending upon Tidewater supplies. Labor is short in all the districts and conditions a month or two ahead are very uncertain. A shortage of cars for Philadelphia and New York is apparent, and the volume of coal standing at the piers is unusually small.

Bituminous quotations at wholesale, f.o.b. loading ports at points designated, are about as follows, per gross ton:

	Clearfields	Camb. & Som's't	Geo'gs. Creek[1]
Philad'la	$2.40@3.15	$2.75@3.25	$3.07@3.17
New York	2.70@3.45	3.00@3.50	3.37@3.47
Baltimore	.....	.....	3.00@3.10
F.o.b. mines	1.15@1.90	1.50@2.15	2.00@2.10

[1] On contract.

Pocahontas and New River, f.o.b. Norfolk and Newport News, Va., are $3.25@3.50. On cars Providence and Boston prices are $5.50@5.75. A cargo of Georges Creek was quoted on the market at $5.23 alongside.

Anthracite—Now that the local strike in the Shamokin region is off, retailers here are hoping that loading dispatch will improve. Towing movement along the coast has been much better the past fortnight, but the demand for domestic sizes is so great that what coal is received helps the situation only for the time being. Most of the retailers are obliged to operate on a hand-to-mouth basis and are much worried over the outlook for cold weather. Already the large local concerns are sending bituminous transportation to the loading ports to make up for the slow deliveries. Anxiety is widespread and there are already present most of the elements that go to make up a panicky market. The independent shippers are doing a thriving business on such coal as they are able to provide boats for.

NEW YORK

Dealers in the market for anthracite supplies. Full winter circular does not effect buying. Bituminous consumers less critical as to prices. Scarcity of spot coal.

Anthracite—There was good buying of domestic sizes of anthracite during the past week by dealers who wished to take advantage of the last discount. Effective Sept. 1, prices of domestic sizes including pea, advanced ten cents per ton, while there was no buying from dealers in anticipation of a suspension of railroad service for coal to build up stocks to normal.

In the way of production, there has been no improvement. Numerous mines are still idle from button strikes, while there is a general complaint about the indifference of miners to work regularly. With the exception of an embargo on the New Haven against shipments from the Lehigh Valley, coal is now moving without restriction in most every direction.

Egg and stove coal continue very short. Shipments are readily moved at full circular prices. This week finds practically all discounts removed from chestnut, which is now in much better demand. Pea coal is also stronger.

With the exception of some inferior grades, which are in small supply, the steam sizes are selling at full circular. Choice grades are in good demand and it is predicted in some circles that these may sell at premiums before very long.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual
Broken	4.95	....
Egg	5.45	5.45
Stove	5.65	5.65
Nut	5.75	5.75
Pea	4.00	3.90@4.00
Buck	2.75	2.65@2.75
Rice	2.20	2.00@2.20
Barley	1.95	1.90@1.95

Quotations at the upper ports are generally 5c. higher on account of the difference in water freight rates

Bituminous—The bituminous situation is much stronger this week. Consumers are showing more eagerness to secure prompt shipments and there is not the effort to beat down prices that has heretofore existed. Considerable buying by New England interests has given strength to mine prices in the Pennsylvania regions. A great deal of spot coal has been sold for New England shipment during the past week, and as a result operators are asking from $1.50 for medium to $1.85 for choice grades, with some shippers of fancy grades holding their coals at $2. There has been no improvement in car supply, while production is also much affected by shortage of labor.

At the tidewater ports supplies for spot sale are small. At the local piers prices are five to ten cents higher this week on certain grades.

Current quotations for various grades, gross tons, f.o.b. Tidewater, follow:

	Port Reading	St. George	Mine Price
Geo. Crk. Big V.	$3.50@3.65	$3.50@3.65	$1.95@2.10
Geo. Crk. Tyson	3.10@3.30	3.10@3.30	1.55@2.75
Clearfield	3.05@3.25	.....	1.45@1.65
South Frk.	.....	.....	1.80@2.00
Nanty Glo.	.....	.....	1.65@1.75
Som. Co.:			
Medium	3.05@3.15	3.05@3.15	1.45@1.50
Qu'h'ing	3.15@3.35	3.15@3.35	1.65@1.70
W. Va. Fairmont ¾	3.20@3.40	3.20@3.40	1.40@1.45
Fair't mine-run	3.00@3.15	3.00@3.15	1.25@1.35
West. Md.	3.00@3.05	3.00@3.05	1.45@1.50

PHILADELPHIA

Anthracite production fully absorbed. Winter schedule in effect. Big shipments to outside markets keeps local prices stable. Pea active and buckwheat all taken, but other steam grades slow. Bituminous prices increases with coal scarce.

Anthracite—The big companies are assuming an independent attitude which is a sure sign they are looking with complaisance upon their ability to secure as much business as the present supply will warrant. Unless all signs fail it will not be many weeks before the demand for all sizes will be much greater than during August. The delay in opening the schools on account of the state quarantine may keep many families from returning to the city and thus postpone the activity among the retailers.

The retail men are reporting that their business is showing greater signs of betterment than last year. They are receiving many inquiries, too, from regular customers which are not resulting in orders, as the public does not seem to have accepted the increased prices which went into effect following the labor adjustment last May. As a consequence of the increase of 10c. a ton on Sept. 1 ordering was considerably stimulated the past week so as to get as much coal as possible at the old rates before the winter schedule became effective.

Judging from the production the past ten months it would appear that in order to rush fuel to the Eastern and Western markets, where the demand seems incessant, the companies allowed the local trade to believe they were way behind the tonnages of previous years. This call for heavy consignments to other markets has been the means of keeping up prices here and enabled the shippers to enjoy an unusual summer's business. It has been a number of years since the individuals have indulged in so little price cutting. The new association of the smaller operators may claim some credit for this, but it is more probably due to general conditions.

Broken coal is actually scarce. The demand for this size on contract orders allows only a small tonnage for transient business and we know of none being shipped at less than the year around circular of $3.60.

Egg is still very active. New England alone has taken such quantities that the local market is actually short and there is no trouble in moving any available tonnage at $4.15.

Stove requisitions continue with no abatement, many orders for August running into this month unfilled, and there is little probability of all orders for this size being filled in September. Some shippers are refusing additional business and one large company has notified its selling force that there will be a delay of about four weeks in filling orders. Of course $4.40 is the price, even for inferior grades.

Chestnut is undoubtedly gaining strength, but the companies who are holding to the full circular of $4.50 are actually very long on it. They seem to have adopted the plan that the one way to force its sale is to refuse to accept orders for the short sizes unless some chestnut accompanies them.

Pea coal is coming into its own. The improvement has been gradual but steady and it is now bringing the full circular price of $2.80 without question except on off coals. Report was heard this week of a block selling for $2.50, but this was found to be a quality of coal that most dealers would refuse even at that figure. There is every indication that the demand for this size will continue to increase as the season advances.

Of the steam coals buckwheat is running away from the other sizes and there seems to be very little for sale even at the circular price of $1.65. It is heard occasionally that the individuals are actually beginning to ask premiums for this size. The other steam coals continue very quiet.

The winter schedule which went into effect yesterday, with the issuance of the company circulars, is as follows, prices being per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide shipment:

	Line	Tide
Broken	$3.60	$4.75
Egg	4.15	5.25
Stove	4.40	5.60
Nut	4.50	5.55
Pea	2.80	3.70
Buck	1.65	2.55
Rice	1.00	.....
Boiler	.90	1.80
Barley	.75	.....

Bituminous—Considered from the standpoint of orders, business continues to increase, but the difficulty in making deliveries has also increased in greater ratio. With most all rail embargoes removed the demand for coal is strong from all points, which naturally tends to curtail local deliveries. All shippers continue to complain of the deficient car supply and shortage of labor, with no prospect for betterment for many months to come.

Brokerage business continues to be practically without profit on account of the close prices at which purchases are made. The railroads, too, while not actually in urgent need of increased shipments, are pressing their contractors strongly for more fuel, presumably for stocking. The prices remain quite firm, with small increases in some of the Pennsylvania coals, and also similar advances in a few of the Fairmont grades.

The prices per gross ton at the mines are as follows:

Georges Creek Big Vein	$1.95@2.05
South Fork Miller Vein	1.95@2.00
Clearfield (ordinary)	1.50@1.60
Somerset (ordinary)	1.50@1.60
West Va. Freeport	1.35@1.40
Fairmont gas	1.60@1.70
Fairmont gas, mine-run	1.45@1.65
Fairmont gas, slack	1.25@1.30
Fairmont lump, ordinary	1.45@1.50
Fairmont mine-run	1.35@1.40
Fairmont slack	1.25@1.30

BALTIMORE

Anthracite in better supply and business up to seasonal average. Soft-coal market tight and prices stiffen. Exports fall off.

Anthracite—A more liberal supply of all sizes is noted and coal men are taking advantage of this to make deliveries as rapidly as possible. A few are still shipping on orders placed in July, or even June, but all are hopeful of clearing these up before the usual fall rush develops. There is

not now so much complaint as was expected by the trade at the increased prices. Coal men claim they are making no more under the new schedule than before, and in some cases find their profits have been reduced.

Bituminous—The soft-coal market is very tight here. There is little or no free coal at tide and premium prices have prevailed for spot coals in most cases. Many fuels are practically out of the market on contract, except for small amounts. Car supply has been fair the past week, but the mines, with shorter labor supply, are unable to get enough coal moving to create any surplus.

Prices to the trade are about as follows, at the mines per gross ton: Georges Creek, Tyson, $1.75 to 1.85; Miller vein, $1.60 to $1.65; Quemahoning, $1.75; Somerset, $1.55; Freeport, $1.35; Fairmont, gas, three-quarter, $1.45; same, mine-run,, $1.35; slack, $1.25.

Exports—The export situation is not up to the average of a year ago. Official figures show a July movement on export from Baltimore of 100,084 tons, as against 258,000 in July of 1915. August will probably run between 80,000 and 90,000 tons, against 210,000 tons in the same month a year ago. Of course, 1915 was the record year, and the trouble this year being the high ocean freights.

HAMPTON ROADS

Exports heavy and coastwise shipments increasing. Bunker steamers plentiful. Local demand unusually strong. Stocks below normal. Prices make a sharp advance.

Coal exports from Hampton Roads continue to move in the satisfactory volume which has been evident for the past several months. Exporters believe this will keep up for some time to come, at least until the British output is larger. American coal is increasing in favor in all foreign markets and there is no reason why a large part of the present export business should not be retained after conditions become normal. The mails from England bring news of unsatisfactory conditions in the trade there. Delays on account of a strike of trimmers, difficulty in securing licenses from the government for shipment to neutral markets are among their troubles.

American coal is quoted at $30 c.i.f. Genoa. About one cargo per week is now shipped from Hampton Roads to France. The steamer "Hesperos" sailed recently with a part cargo of high volatile coal for Callao, Peru. Other exports consisted of Pocahontas and New River and small lots of coke.

Coastwise shipments show an increase over last week. The steamer "Selwyn Eddy," a recent addition to the coastwise coal fleet, loaded her first cargo of coal at Sewalls Point on Aug. 26; the capacity of this steamer is some 4,500 tons. The Fleet, which has been engaged in the war game off the Atlantic Coast, arrived here last Sunday and will require a large tonnage of coal.

Stocks are small, though most shippers are able to take care of their requirements with but little delay to vessels. There is no present indication of surplus coal being available in the near future.

Prices are higher than last week and are expected to show further increases. Demand is heavy from all branches of the trade, especially local consumers. The ruling quotations are as follows: Pocahontas and New River, $3.25@3.50 per gross ton for export and coastwise shipment; $3.40@3.50 per gross ton, plus 10c. per ton for bunker delivery, $2.90@3.10 per net ton on tracks. Anthracite is $7.50 per net ton, delivered.

The "Kongsloi," formerly the American-Hawaiian liner "Artisan," which has just been transferred to the Norwegian flag, has loaded a cargo of 8,200 tons of Pocahontas coal for Buenos Aires. This is the steamer on which the American owners are reported to have realized a profit of close on a million dollars in selling her.

Railroad Tonnages—The following is a comparative statement of the tonnages handled by the different roads for the weeks ended Aug. 26, 1915-16, and for the first 9 weeks of the years:

	Week		9 Weeks	
	1915	1916	1915	1916
Nor. & West.	211,699	174,227	1,643,289	1,439,237
Ches. & Ohio.	103,472	106,121	885,151	882,105
Virginian.....	82,131	71,313	607,220	794,506
Total.....	397,302	351,661	3,135,660	3,116,048

PANAMA CANAL

The following notice issued to steamship lines is reported in the "Canal Record":

1. In view of the present high price and scarcity of bottoms, and the difficulty experienced in maintaining the coal reserve on the Isthmus, on and after Oct. 1, 1916, and until further notice, the following prices will obtain at the Panama Canal for coal supplied steamships, including warships of all nations:

Cristobal-Colon—Delivered alongside of vessel in lighters or in cars on the wharves, trimmed in bunkers, when handled by ship's gear (per ton) $7.50.

Balboa—Delivered alongside of vessels in lighters or in cars on the wharves, trimmed in bunkers, when handled by ship's gear (per ton), $9.

An additional charge of $2 per hour will be made for the use of each mechanical hoist or crane furnished by the Panama Railroad Co.

Ocean Shipping

VESSEL CLEARANCES

The following vessels have cleared with coal cargoes during the past week:

NORFOLK

Vessel	Destination	Tons
Florence Howard[6]	Para, Bra.	1,328
Sweethope[3]	Buenos Aires, A. R.	3,569
Jaguaribe[5]	Rio de Janeiro	2,217
Lovland[1]	Santos, Bra.	3,029
Fortunata[1]	Italy (Any port)	4,224
J. Holmes Birdsall[4]	San Juan, P. R.	2,023
Orla[1]	Leghorn, Italy	5,850
Genova[1]	Spezia, Italy	5,458
Bergenhus[1]	Genoa, Italy	5,396
Don Cesar[6]	Buenos Aires, A. R.	4,490
Rosalia L[1]	Genoa, Italy	9,270
Dondo[3]	Lisbon, Portugal	5,055
Don[5]	Pernambuco, Bra.	1,879
Normanton[1]	Savona, Italy	5,633
Birkhall[7]	Caleta Coloso, Chile	3,486
Beckenham[8]	La Plata, A. R.	6,248
Doris[9]	Italy (Any port)	5,525
Russ[8]	Montevideo, Uruguay	3,388
Lysefjord[10]	Santiago, Cuba	1,111
Glenorchy[7]	Rio de Janeiro, Bra.	6,400
Cuthbert[7]	Pernambuco, Bra.	1,275

NEWPORT NEWS

Rose Lea[7]	Rosario, A. R.	3,716
Hesperos[11]	Callao, Peru	5,492
Nantwen[12]	Genoa, Italy	7,428
Oldfield Grange[2]	Havana, Cuba	7,561
Ocland[3]	Cienfuegos, Cuba	4,510
Collingham[2]	Marseilles, France	5,689

PHILADELPHIA

Lily	Greece	*4019
Munorway	Havana	
Ninetta M. Porcella	Charlottetown, P. E. I.	
Nuceria	Rio Janeiro	2,872
Republic	Rio Grande de Sul	
Torne	Narvik	
Pinal del Rio	Havana	1,607
Marita	Santos	1,641
Margarcia[2]	Sagua la Grande	
Lodaner	Havana	
Annetta	Gibara and Vita	

* And 418 tons coke.

BALTIMORE

Loch Garve	Italy	2,605
Ulrick Holm	Panama	2,284
Solstad	Egypt	5,693

[1] Pocahontas Fuel Co. [2] Berwind-White Co. [3] Castner Curran & Bullit. [4] Baker-Whiteley Co. [5] Smokeless Fuel Co. [6] West Virginia Coal Co. [7] C. & O. Coal & Coke Co. [8] Northern Coal Co. [9] Flat Top Fuel Co. [10] C. G. Blake Co. [11] Island Creek Coal Sales Co. [12] C. H. Sprague & Son.

OCEAN FREIGHTS

There are a number of ready boats now available for export coal that can be secured on very favorable terms, but for late loading freight conditions are practically the same as a week ago. None of the few charters that were made during this period for export coal have been reported.

We would quote freight rates on coal by steamer as follows:

West Coast of Italy	$27.60@28.80
Marseille	26.40 about
Barcelona*[2]	24.00 about
Montevideo	15.00 about
Buenos Aires	15.00 about
Rosario	15.60 about
Rio Janeiro	13.50@14.00
Santos	14.00@14.50
Chile (good port)	8.00@10.00
Havana	3.75@ 4.00
Cardenas or Sagua	5.00@ 5.50
Cienfuegos	5.25 about
Port au Spain, Trinidad	5.50@ 6.00
St. Lucia	5.50 about
St. Thomas	5.00 about
Barbados	5.50@ 6.00
Kingston	5.25@ 5.50
Curacao[1]	5.00@ 5.25
Santiago	5.25@ 5.50
Guantanamo	5.25@ 5.50
Bermuda	4.25@ 4.50
Vera Cruz	5.50@ 5.75
Tampico	5.50@ 5.75

* Spanish dues for account of cargo. [1] And p.c. [2] Or other good Spanish port.

Note. Charters for Italy, France and Spain read: "Lay days to commence on steamer's arrival at or off port of discharge."

W. W. Battie & Co.'s Coal Trade Freight Report.

COASTWISE FREIGHTS

There is perhaps a somewhat better supply of carriers for Hampton Roads loading, due to the shortage of coal there, but rates have not been affected. A recent steamer charter at $2 for four trips to Boston is a fair indication of the current market; $1.85 is asked on smaller transportation from Norfolk to Providence; $2.50 was again paid this week to Bar Harbor, Me., out of New York, and $3.50 to Halifax, N. S., these on 500- to 600-ton schooners. Barges to Long Island Sound ports are $1.10@1.25, depending on destination and size. The demand just at present much exceeds the supply.

OCEAN CHARTERS

Coal charters have been reported as follows during the past week:

PHILADELPHIA

Vessel	Destination	Tons	Rate
Annetta	Vita, Cuba	740	
Pinar del Rio	Havana	1,607	
Forde	Rio Janeiro	1,364	
Pathfinder	San Juan, P. R.	1,800	
Lodaner	Havana	2,106	
Thelma	St. John's, N. F.		846

BALTIMORE

Teviotdale	Buenos Aires[1]		$15.00

VIRGINIA

Lovland	Santos	1,463	
Jeremiah Smith	Sanchez	336	[2]6.00
Nuceria	Rio Janeiro		15.50

ATLANTIC RANGE

F. A. Duggan	Bahia	981	[3]14.00
Mary W. Bowen[4]	Marseilles	1,907	18.00

[1] Or La Plata. [2] And port charges. [3] And coke $16. [4] Four or five trips.

Lake Markets

PITTSBURGH

Heavier demand and higher prices. Increased Lake shipments follow settlement of dock strike.

There is an insistent demand from some quarters for coal and high prices are often paid for round lots, while small accumulations from day to day sell at much lower prices and thus the market is quotable at a wide range. There has been considerable inquiry for large lots for delivery over a month or two but operators have had to be conservative in quoting as car supplies are poor and might easily grow much worse. At the majority of mines production is more or less restricted every week by car shortage and considerable labor shortage is also reported, more than was the case a month ago.

With the settlement of the strike of the dock workers at the head of the Lakes last week, there is a better movement of coal up the Lakes, but the prediction is still made that some coal will have to be moved this winter by the all-rail routes. The heavier production of slack has not affected the market for this grade, which indeed is a shade firmer than a week ago. While some fancy prices are reported as paid in exceptional cases, the general run of the market is approximately as follows, the lower prices being for odd lots that have to be sold from day to day while the higher prices are for definite lots for guaranteed shipment: Slack, $1@1.05; mine-run, $1.40@1.60; ¾-in., $1.50@1.60; 1¼-in., $1.60@1.70, per net ton at mine, Pittsburgh district. The circular price remains at $1.50 for mine-run, but is practically nominal, as higher prices would be asked.

BUFFALO

Anthracite improves to the westward but still light here. Bituminous situation mixed. Car shortage increasing.

Bituminous—The old difficulties, so hard to explain, are still with the trade. The consumer buys in a rather small way and is not disturbed because it is difficult to get an order filled. Car movements are slow and growing still slower; reports of two weeks between shipment and delivery over short distances are common. It is plain that the fall crop movement will cut down the car supply so far that bulk freights will be almost at a standstill. Consumers do not seem to fear a general railroad strike.

The miners are working somewhat better, though there will not be enough to get out much of a surplus. The complaint now centers more on the car shortage than the lack of men. The petty strikes are not over yet, but they are less frequent and will likely subside entirely as better working weather comes in. This market still reports a larger supply coming from the Bessemer district, where strikes continued a long time.

Coal arrives by districts much as formerly, except that the Ohio No. 8 grade is more plentiful; it is mostly three-quarter, selling at about $2.50, which brings it enough below Pittsburgh to give it a market. Regular quotations are as follows:

	Pittsburgh	Allegheny Valley	Penn Smokeless
Lump	$2.95	$2.75	$2.80
Three-quarter	2.85	2.60	....
Mine-run	2.75	2.50	2.60
Slack	2.40	2.30	2.60

Prices are per net ton, except east of Rochester and Kingston, Ont., where they are per gross ton.

Anthracite—Some improvement is reported in the line movement. It appears that certain sec-

tions in the West are afraid that the winter supply is going to be short. As a rule the spurt has been made too late for August delivery and the last reduction will be missed. Canada has done better than this and though the buying has not been heavy it is better than that locally. Buffalo seldom buys much till the coal is wanted. The city orders have been small for a long time, so that the fall buying will have to be heavy if a normal supply is to be accumulated for the opening of winter.

Shipments by Lake were 78,800 tons, distributed over a dozen ports, the principal ones of which were: 34,650 tons for Duluth and Superior, 7,900 tons for Milwaukee, 7,800 tons for Waukegan and 7,500 tons for Sheboygan. Freight rates have advanced sharply to most points, being $1 to Racine, 85c. to Milwaukee and Sheboygan, 75c. to Manitowoc and Depere, 50c. to Chicago and Waukegan, 40c. to Hancock, 35c. to Ashland and 30c. to Duluth, Fort William and Port Arthur.

TORONTO, CANADA

Demand continues light. Stocks on hand well maintained, but deliveries slow. Prices advancing.

The demand for both anthracite and bituminous continues rather light, with no special features. Notwithstanding the prospect of further price advances, manufacturers show no marked activity in laying in stocks ahead. Supplies on hand have been considerably replenished since the removal of the embargo by the Grand Trunk last week, but deliveries continue slow by reason of labor shortage.

Wholesale prices for bituminous were advanced on Sept. 1, and current quotations for best grades per short ton are as follows: Retail, anthracite egg, stove and nut, $8; grate, $7.75; pea, $6.75; bituminous steam, $5.25; screenings, $4.50; domestic lump, $6; cannel, $8. Wholesale f.o.b. cars at destination, bituminous three-quarter lump, $4.35; screenings, $3.45; Pennsylvania smokeless lump, $4.50; Pocahontas lump, $5.75; slack, $4.30.

CLEVELAND

No let up in the advancing prices. Labor and car shortage getting worse. Ohio coals going into West Virginia markets.

There has been no let up in prices and from all appearances there will not be any decline. Railroads promise no improvement in car supply and the labor situation is getting tighter every day. No. 8 field in Ohio needs from four to six thousand men to give the mines their full quota.

The Western markets that use a great deal of West Virginia and Kentucky coals are now buying Ohio grades to take care of contracts.

Lake shipments are gradually increasing as the usual fall demand for Lake coal has started. In fact every condition existing has a tendency to create a greater demand and higher prices.

Following are the market prices per short ton, f.o.b. Cleveland:

	Three-quarter	Mine-run	Slack
No. 8	$2.30	$2.10	$2.15
Cambridge	2.20	2.10	2.10
Middle Dist	2.10	2.00	2.00
Hocking	.....	.....	2.00
Youghiogheny	2.60	2.50	.....
Pittsburgh	2.60	2.50	.....
Pocahontas	.....	3.05	.....
Fairmont	.....	.....	.....

TOLEDO

New coal route from Toledo to north increases transportation facilities. Lake coal being rushed as season advances.

Coal is being rushed to shipping points rapidly as the season advances and Lake shipments continue very heavy. There is considerable coal at local docks for shipment. Steam coal is in good demand here and domestic has been somewhat strengthened by the call for threshing coal.

The supply of coal to be used this season by Lucas County will be supplied by the West Crescent Fuel Co., at $3.33 per ton.

A new coal route which will be important as adding to facilities for the transportation of coal to the north has been opened, and gives Toledo direct connection with Detroit and Canadian ports. The line runs from West Toledo to Dundee, Mich., 21½ mi., and has been leased by the Detroit, Toledo & Ironton.

DETROIT

Prices on steam coal advance on suspension of West Virginia shipments. Domestic sales are light. Lake shipments restricted.

Bituminous—Sharp price advances in the local market have followed the cutting off of shipments of steam coal from the Cabin Creek section, where recent floods destroyed transportation facilities. Jobbers and wholesalers who have been quoting West Virginia slack at 85@90c. at the mines now ask as high as $1.50, with mine run at $1.25@1.35, three-quarter lump $1.35@1.50, and some holding domestic lump at $1.75. There is, however, little demand for lump. Owing to use of Hocking to replace the West Virginia supply, Hocking slack is now held at about $1.25 at the mines.

Neither retail dealers nor consumers are buying much domestic coal, despite the warnings of wholesalers that shipments will be more difficult to obtain soon. There is not much coal on tracks and little or no stock is offered at cheap prices.

Anthracite—Slightly more buying is reported by some wholesalers. Stove size is still rather difficult to get on prompt delivery.

Lake Trade—Vessel owners sent more of their boats on the upbound trip without cargo this week to avoid the delay, which would attend the holding of the boats in port over Sunday and Labor Day. Even some of the boats under contract to carry coal are going up without cargo. With the amount of coal arriving for shipment reduced by the cutting off of West Virginia coal, shippers are unable to line up sufficient capacity to move their consignments. A $1 rate is paid on a cargo of anthracite from Buffalo to Racine and on soft coal 85c.@$1 is given on shipments from Lake Erie to the principal Lake Michigan ports.

COLUMBUS

All grades of coal advanced in price Sept. 1. Increasing domestic trade reported on all sides. Steam and Lake business continue brisk.

The chief feature of the trade is the advance in the circular, effective Sept. 1. All grades and varieties have been increased from 10 to 15c. per ton. The change is due to the big increase in the demand, especially for domestic purposes, the growing car shortage and the curtailing of production from West Virginia fields, as a result of the flood of several weeks ago. The market is very strong and prospects for the future are extremely bright.

Domestic business is more active than at any time during the present season. Consumers are placing orders for immediate delivery and dealers are rushed with business. Pocahontas is selling well and the same is true of West Virginia splints. Hocking lump is also being stocked in large quantities. Retail prices have been advanced to conform with wholesale quotations and all grades are up 25c. on the former delivered price. Anthracite prices are firm at 25c. higher. Rural dealers are buying in larger quantities.

The steam business continues active. The movement on the part of large consumers to stock up because of the threatened railroad strike and to guard against emergencies is being attended with difficulties. The cutting off of a large production in the West Virginia fields has made steam sizes rather scarce. Contracts are taking about all of the available tonnage. As a result buying off the open market must be done at higher figures than usual for this time of the year.

Lake trade is still active and there are no indications of a decrease in tonnage. The demand from the head of the Lakes is still good. The movement from the docks to the interior is steady. Boats are quite scarce. Lake prices are growing stronger.

The car supply is becoming worse, especially on lines reaching West Virginia fields. In some instances the supply is not 50% normal. Eastern Ohio fields are also being curtailed by lack of railroad equipment. The Hocking Valley R.R. is the best off although reports of shortage are received from shippers on that line.

Prices on short tons, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio
Rescreened lump	$1.75	$2.00	.....
Inch and a quarter	1.65	1.85	$1.65
Three-quarter inch	1.55	1.75	1.45
Nut	1.40	1.50	1.35
Egg	1.40	1.45	.....
Mine run	1.35	1.40	1.30
Nut, pea and slack	1.15	1.20	1.15
Coarse slack	1.05	1.10	1.05

CINCINNATI

Market strong, due to the advancing season and flood damage in West Virginia. Higher prices are in sight.

The market has been strongly stimulated by the enforced curtailment at the West Virginia mines, and indications are that the stimulus will last for some time to come. Many mines will be unable to resume shipments before Oct. 1, and others may be delayed even longer, especially in view of the fact that miners have gone elsewhere to obtain work.

A better supply of cars has been available for mines in other sections of West Virginia, not affected by the floods, but nothing like a surplus of rolling stock is reported, and a reduced coal movement seems probable during what should be the most active part of the season. Much of the winter's business is yet to be filled, especially in the retail trade, while the Lake movement usually increases toward the close. However, no real shortage is anticipated, as increased production and movement at mines in operation should take care of the deficit.

Coke

CONNELLSVILLE

Coke moderately scarce with prompt a shade easier in price. Demand for coal will determine coke prices.

The Youngstown Sheet and Tube Co. expects to start the second half of its byproduct coke plant of 204 ovens the second week in September. The first half produced its first coke Aug. 17, as indicated in last week's report. The partial operation of this new plant has not made much of an impress on the coke market and coke is still moderately scarce, although hardly as high prices are now asked for spot, it being possible frequently to shade $2.75, while the market until now has been quotable at $2.75 to $2.85.

Labor performance is still not up to the market, the weather having been almost uniformly hot. When cooler weather comes it will be possible to produce more coke, and there will be less demand, on account of the production by new byproduct ovens. Corrigan, McKinney & Co.'s new plant is likely to start within a month or two, and the Brier Hill Steel Co.'s plant is under contract, with penalty of $500 a day for delay, to be completed Nov. 1.

The consumption of coke, as a whole, does not promise to change materially, as the blast furnaces are endeavoring to make as much pig iron as posible and will continue to do so. The coke market in the next few months will not be made by the relation between demand and supply in coke, but by the demand for raw coal and coke will sell practically at cost of production, based on the value of coal made by the open market. We quote: Spot furnace, $2.65@2.75; contract furnace, nominal, $2.50; spot foundry, $3.25@3.50; contract foundry, $3.25@3.50, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Aug. 10 at 408,060 tons, an increase of 4,720 tons, and shipments at 408,179 tons, an increase of 6,602 tons.

Buffalo—The market is strong, on account of the scarcity of men and the heavy consumption. Quotations remain on the basis of $5.25 for best 72-hr. Connellsville foundry, $5 for 48-hr. furnace, $4.40 for high sulphur and $4.25 for stock coke.

Chicago—Coke producers complain of a growing scarcity of cars. Domestic sizes are in urgent demand as the end of the month approaches. Some industrial plants are storing coke in anticipation of a railroad strike. All sizes have been selling at a premium.

Nominal prices per net ton, f.o.b. cars Chicago, are as follows: Connellsville, $6@6.25; Wise County, $6@6.25; byproduct foundry, $6@6.25; byproduct domestic, $4.95@5.30; gas house, $4.50@4.75.

Middle Western

GENERAL REVIEW

Expansion of trade in every direction. Domestic demand growing and steam sizes quite strong. Smokeless coals tightening up. Anthracite buying more active.

Industrial and manufacturing interests in this section, are operating at a rate never before approached, and this prosperity is now beginning to be reflected in the coal trade. All districts serving the Western markets report increased shipments. Operators are firm in the conviction that sharp and decisive advances in prices will occur during the fall months owing to the restricted labor and car supply, together with the greatly increased consumption. Buyers were very active recently due to the fear of a railroad strike and the effect on the market was quite pronounced. Ordering of domestic sizes by retailers for fall and winter use will be deferred no longer than Sept. 1. Many dealers must undertake to meet their requirements without further delay, despite handicaps of labor, car scarcity and high prices. Illinois and Indiana prices are now averaging at least 20% higher than at this time last year.

Some of the larger steam users are attempting to accumulate a surplus, but it is difficult to buy tonnage in the open market at attractive prices. The strength of smaller steam coal sizes remains undiminished. Operations at Illinois and Indiana mines have been at full capacity. The crop shortage will tend to affect coal consumption at Northwestern points, which will help relieve the situation at upper Lake docks. The demand for lake coal from interior points continues unusually heavy, and much higher prices are anticipated. Rumors are current that there will be an advance in the dock rates on Eastern coal effective Sept. 1, and it is understood that this will absorb a portion if not all of the recent increase obtained by the retail companies. Southern Illinois coal will generally take an advance of 15c. per ton in Northwestern territory Sept. 1, while the Central Illinois product will rise 10c. per ton. The demand for Central Illinois coal in this section will not be large until later in the season.

It is said that the railroads, which were granted permission recently to advance the rate 5c. per ton on Indiana and Illinois coals moving interstate, will publish higher rates to Wisconsin and Michigan points Sept. 1, but will take no immediate action upon the rates between Illinois and Indiana. The supply of West Virginia smokeless mine-run has hardly been adequate. Many Western retailers have placed heavy orders recently, with the hope of getting under cover at this month's prices.

CHICAGO

Demand rising with prices stronger. Smokeless mine-run shipments limited. Steam coals active. Anthracite gains its stride.

The fall demand for domestic sizes has set in with a vengeance at Southern Illinois mines, and railroads and steam plants are buying with more freedom. Cooler weather has made the demand stronger. Screenings show no recession from the high prices recently prevailing. Heavy rains and floods have put some of the mines temporarily out of commission, while railroad washouts interfered with shipments and car supply. The new schedule of prices for Franklin and Williamson County coal for September shipment will be on the following basis: Franklin County, lump, $1.90; egg, $1.90; No. 1 nut $1.90; No. 2 nut, $1.65; No. 3 nut, $1.40; No. 4 nut, $1.25; Screenings, 90c. to $1; mine-run, $1.45. Williamson County, lump, $1.85; egg, $1.85; No. 1 washed, $1.90; No. 2 washed, $1.60; No. 3 washed, $1.40; mine-run, $1.40; screenings, 90c. to $1. The decrease in unbilled domestic sizes at the Franklin County mines has amounted to approximately 40,000 tons this week. There is now on hand only about 300 cars of domestic sizes but this will be absorbed rapidly.

Domestic shipments from the Springfield district have increased considerably and steam business has shown greater activity. Screenings are quite strong, ranging around $1 per ton. Some premium prices have been paid for Springfield screenings for urgent delivery.

The demand for steam coals from various Indiana districts is especially strong, and they have been selling at 95c. to $1.05. Some of the mines are already sold two weeks ahead on steam coals. Running time has improved materially.

Smokeless mine-run is scarce owing to heavy shipments eastward from the Pocahontas field. Lump and egg show some irregularities; lower grades have been sold at concessions, while fancy grades find a ready sale at circular figures. Pennsylvania shipments have been too scarce to establish arbitrary quotations. There is not a large supply of smokeless grades in stock in retail yards, and in consequence the local market has been tightening up, owing to rush of orders placed by the dealer trade. No concessions in mine-run are made, and premiums have been exacted for prompt deliveries.

Kentucky prices are rising both on domestic and steam coals, with mines in the eastern part of the state not disposed to seek new trade. Shortage of cars and labor has so curtailed the output of eastern Kentucky mines that surplus tonnage is at a minimum. Strike difficulties in the western Kentucky fields are practically over, and the operators are now putting forth efforts to regain lost tonnage and seeking new business. However, the district is handicapped by the short car supply which is only about 50% of requirements. Restricted tonnage has been reaching this territory from Kentucky fields. Hocking is being sold at higher prices, and splint orders are still in excess of the supply.

Increased ordering of anthracite sizes is quite noticeable, with chestnut in the lead. Complaints are made by the wholesalers as to the irregularity of receipts via all-rail as well as at the docks, and the activity toward the end of the month is likely to see a shortage in some quarters. Retailers are still behind other seasons in placing their orders. Distribution to householders falls far short of what has usually obtained at this time of the year.

Quotations in the Chicago market are as follows, per net ton f.o.b. cars mines:

	Wilms. and Frank. Cos.	Springfield	Fulton and Peoria	Clinton	Green and Knox Cos.
Lump	$1.75	$1.60@1.75	$1.60@1.75	$1.40@1.60	$1.50@1.60
Steam lump	.....	1.30@1.65	1.50@1.65	1.30@1.50	1.30@1.35
2½ and 3-in. lump	.....	.....	.....	.....	1.40@1.50
1¼-in. lump	.....	.....	.....	.....	.....
Egg	1.75	1.60@1.75	1.60@1.75	1.50@1.70	1.50
Nut	.....	1.25	1.50@1.60	1.50@1.65	1.30@1.40
No. 1 washed	1.75	.....	.....	.....	.....
No. 2 washed	1.50@1.55	.....	.....	.....	.....
No. 1 nut	1.75	.....	.....	.....	.....
No. 2 nut	1.55	.....	.....	.....	.....
Mine-run	1.25	1.15	1.35@1.45	1.15@1.30	1.15@1.25
Screenings	0.95@1.05	0.90@0.95	1.05@1.10	0.95@1.10	0.95@1.05

	Saline and Harrisburg	E. Kentucky	Pocah. and W. Va. Smokl.	Penn. Smokeless	Hocking
Lump	$1.65@1.75	$1.75@2.25	$2.00	$1.85@2.00	$1.75@1.80
1½-in. lump	1.35@1.50	.....	.....	.....	1.60@1.75
Egg	1.75	1.45@1.65	1.85@2.00	1.75@2.00	1.60@1.70
Nut	.....	1.25@1.35	1.80	1.60@1.75	.....
No. 1 nut	1.65@1.75	.....	.....	.....	.....
No. 2 nut	1.50@1.55	.....	.....	.....	.....
Mine-run	1.25	1.10@1.25	1.50	1.50	1.15-1.25
Screenings	0.95@1.00	0.90@1.10	.....	.....	.....

W. Va. splint lump $1.60@1.65.

ST. LOUIS

Situation firmer and some companies withdrawing from the market. Consumption at a record breaking pace. Poor car supply and shortage of labor the controlling factors.

The wholesale companies have received a perfect deluge of orders the last week of August. A number have sent out notices that they are half sold up for September. Never before in the history of the coal trade has such a sudden buying movement developed. This has been predicted all along but no one realized that it would be so strong.

A number of mines are almost entirely sold out for the month of September. Prices are jumping on all grades and it is expected that September and October will be record breaking months both from a tonnage and price standpoint. The price on steam coal holds at the very peak of the summer level and shows absolutely no sign of going off. It is one of the remarkable things in the present situation.

A large part of the present rush is caused by the poor car supply and anticipation of its becoming still worse. Scarcely any of the mines get more than four days and the average for the state is very little over half time.

The Standard mines are all sold up and have advanced prices anywhere from 15 to 30c. a ton. Franklin County producers have announced that they are oversold on lump.

The market is quotable on the following basis per net ton, f.o.b. mines:

	Williamson	Staunton & Montgomery	Intermediate	Standard
6-in. lump	$1.50@1.65	$1.35	$1.40	$1.20
6x3-in. egg	1.50@1.65	1.35	1.40	1.20
3x2-in. nut	1.50@1.65	1.35	1.40	1.10
No. 2 nut	1.25	1.10	1.25	1.00
No. 3 nut	.....	.....	.....	.....
No. 4 nut	.....	.....	.....	.....
No. 5 nut	.....	.....	.....	.....
Screenings	0.90	0.90	0.85	0.85
2-in. lump	.....	.....	....	0.95
Steam egg	.....	1.25	.....	0.90
Mine-run	1.20	1.15	1.10	0.95
Washed	.....	.....	.....	.....
No. 1 nut	1.75	1.60	1.60	1.50
No. 2 nut	1.55	1.40	1.40	1.40
No. 3 nut	1.40	1.30	1.30	1.30
No. 4 pea	1.30	1.20	1.20	1.20
No. 5 slack	0.75	0.75	0.75	0.75

KANSAS CITY

Domestic demand more active and steam grades slightly firmer.

Domestic demand was slightly stimulated by the increase of 25c. a ton on most grades Sept. 1. As usual, the response to the prospective increase is slow, the last days of the month seeing the heaviest volume of orders. Many householders postpone buying, and are waiting even beyond the first of September, in the belief that the rates on Illinois domestic coal will be lowered, as was the case with the steam-coal rate, and that coal from the East will be cheaper.

General Statistics

IMPORTS AND EXPORTS

The following is a comparative statement of coal imports and exports of the United States for June, 1915-16, and for the 12 months ending June, 1914-15-16, in long tons:

	June		Twelve Months		
Imports	1915	1916	1914	1915	1916
Anthracite, total	22	31	8,124	12,358	7,230
Bituminous, total	118,719	101,041	[1]1,358,002	1,429,608	1,618,539
United Kingdom	.....	200	11,025	35,059	8,375
Canada	85,525	81,160	1,005,693	1,120,670	1,432,792
Japan	11,750	17,950	85,689	89,240	89,400
Australia	21,094	1,461	251,977	182,041	86,006
Other countries	350	270	3,618	2,598	1,966
Coke	4,832	3,420	[1]112,541	88,805	59,753
Exports					
Anthracite total	352,636	515,139	3,959,114	3,682,188	3,879,183
Canada	352,234	506,932	3,897,365	3,621,234	3,749,529
Argentina	.....	.....	.....	595	2,926
Brazil	.....	.....	.....	49	2,473
Uruguay	5	.....	84	5	600
Other countries	397	8,207	61,665	60,305	123,655
Bituminous total	1,933,410	2,065,509	15,704,966	14,412,995	18,753,684
Italy	383,019	230,968	.....	1,628,279	2,797,506
Canada	873,239	1,318,095	11,472,397	8,425,103	10,492,944
Panama	47,708	27,553	362,427	343,372	473,183
Mexico	22,445	7,716	296,392	391,611	209,809
Cuba	74,984	108,579	1,129,954	1,065,206	1,243,394
West Indies	48,406	36,163	577,541	461,892	575,368
Argentina	157,831	103,176	139,409	563,889	779,846
Brazil	122,484	61,308	239,082	527,264	678,766
Uruguay	11,968	62,452	103,639	154,334	154,334
Other countries	191,326	135,122	1,425,312	902,740	1,348,534
Total coal	2,286,046	2,580,648	19,664,080	18,095,183	22,632,867
Coke	68,628	89,835	742,476	602,473	976,398
Bunker coal	727,880	727,168	7,811,913	7,062,653	7,540,551

[1] Part year only.

BALTIMORE & OHIO R.R.

The following coal and coke tonnage was moved over the Baltimore & Ohio R.R. and affiliated lines during the months of June and July, 1916 and 1915:

	June		July	
	1916	1915	1916	1915
Coal	2,934,937	2,883,959	3,000,742	2,887,918
Coke	352,092	329,130	335,094	344,557
Total	3,287,029	3,213,089	3,335,836	3,232,475

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts in July for years 1915 and 1916, in short tons:

	July			
Destination	1916	%	1915	%
Tidewater	427,412	19	484,489	24
East	176,052	8	154,618	7
West	1,489,000	65	1,233,260	60
Total	2,092,464		1,872,367	
From Connections				
Bituminous	182,840	8	182,289	9
Anthra. (local)	140		.....	
Anthracite	1,430		1,319	
Total	2,276,878	100	2,055,975	100
Coke	35,752		21,960	

Foreign Markets

GREAT BRITAIN

Aug. 15—Owing to the partial holiday last week, the market is barer of coal than has been the case for some weeks past. Prices are accordingly considerably firmer. Quotations are approximately as follow:

Best Welsh steam	Nominal
Best seconds	Nominal
Seconds	$10.80@11.05
Best dry coals	9.60@10.20
Best Monmouthshires	10.80@11.05
Seconds	10.20@10.80
Best Cardiff smalls	6.72@ 6.96
Cargo smalls	4.80@ 5.40

The prices for Cardiff coals are f.o.b., Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—The market is extremely quiet, and the tendency is downward. Rates are approximately as follow:

Gibraltar	$6.60	Port Said	$16.8
Genoa	15.00	Las Palmas	7.2
Naples	15.00	St. Vincent	7.8
Alexandria	17.40	River Plate	8.4

Financial Department

By-Products Coke Corporation

This company reports for the year ended Dec. 31, 1915, as follows:

INCOME ACCOUNT FOR CALENDAR YEARS

	1915	1914
Total earns. from oper...	$768,544	$472,480
Premium on bonds.....	.....	.....
Earns. from investments.	12,180	36,863
Total earnings.....	$780,724	$509,343
Expenses and taxes.....	$69,582	$68,467
Bond, etc., interest.....	103,157	108,399
Depreciation, etc.....	298,023	153,758
Dividends.....	*(6%) 267,263	(4) 155,864
Balance for year.....	$42,699	$22,856

*Includes in 1915 two quarterly dividends of 1% and one dividend of 1½% on the $3,896,000 stock and one dividend of 1½% and an extra of 1% on the $5,235,300 stock.

BALANCE SHEET DEC. 31

Assets	1915	1914	Liabilities	1915	1914
Plant accounts.....	$6,247,786	$3,954,783	Capital stock.....	$5,235,300	$3,896,600
Real estate.....	565,779	462,694	Bonds.....	*3,245,000	2,000,000
Investment in other cos....	607,903	607,903	Bills payable.....	825,620	250,000
Sinking fund.....	372,752	287,267	Accrued bond interest.....	62,631	22,034
Cash.....	278,745	304,357	Wages.....	53,096	20,339
Material and supplies.....	1,792,749	771,111	Miscellaneous.....	28,167	33,886
Accounts receivable.....	936,756	331,950	Accounts payable.....	794,977	65,612
Miscellaneous.....	20,691	18,741	Undivided earnings.....	a578,370	450,335
Total.....	$10,823,162	$6,738,806	Total.....	$10,823,162	$6,738,806

a Before deducting regular dividend of 1½% and extra dividend of 1% paid Feb. 15, 1916, aggregating $130,882, and $17,315 for bonus to employees. * Includes By-Products Coke Corp. bonds, $2,000,000, and Federal Furnace Co. bonds, $1,245,000.

Note—For previous annual report of this company see Vol. 8, p. 830.

Island Creek Coal Co.

President Thomas B. Davis reports for the fiscal year ended Dec. 31, 1915, as follows:

EARNINGS, YEARS ENDING DEC. 31

	1915	1914
Net earnings.....	$907,022	$1,008,388
Reserve for exting. and depreciation, etc.....	128,619	119,672
Net profits.....	$778,403	$888,716
Admin. & gen. exp., etc...	87,895	69,480
Balance.....	$690,508	$819,236
Add—Int. on bank deposits, etc.....	deb. 256	4,245
Total net profits.....	$690,252	$823,481
Preferred dividends.....	299,124	298,872
Common dividends.....	236,977	562,711
Balance, sur. or def. sur.	def. $154,151	def. $38,102

Our production during the year 1915 amounted to 2,213,616 tons, an increase of 6,172 tons over 1914. Conditions in the coal industry during the year 1915 were on the whole unfavorable. Prices remained at a very low figure during the larger part of the year. A marked improvement took place, however, in the last quarter, due to the greatly increased industrial activity in the territory where our coal is marketed. The profits for this year show a decrease of $133,228 against 1914, but we consider these satisfactory in view of the existing conditions.

Additions to property account amounted to $198,028. Also expenditures have been made and charged against the depreciation fund, which has been added to at the same rate as previously, amounting in all to $76,760.

Preferred dividends at the rate of $6 per share per year, and the regular common dividends at the rate of $2 per share per year were paid during 1915.

During the year the principal properties, which stood in the name of the U. S. Coal and Oil Co., were transferred to the Island Creek Coal Co., arrangements being made to pay minority stockholders, who did not exchange stock of the U. S. Coal and Oil Co., which they held for stock of the Island Creek Coal Co., $75 per share. The outlook for the year 1916 is excellent.

CONSOLIDATED BALANCE SHEET DEC. 31 (INCL. SUBSIDIARIES)

Assets	1915	1914	Liabilities	1915	1914
Property acct.....	$5,668,818	$5,470,791	Stock (not par).....	x$4,507,313	$4,502,355
Cash.....	384,175	364,399	Cap. stk. of U.S. C. & Oil Co. not held.....	.....	13,127
Accounts receivable.....	485,099	399,330	Def. payments on property	75,094	87,600
Coal in transit and in storage.....	437,709	525,450	Current liabilities.....	y172,313	183,225
Inventories of materials and supplies.....	227,940	254,658	Dividend paid Jan. 1.....	74,799	74,724
Unexpired insurance, rem. paid, taxes, etc.....	29,674	24,669	Share premium account....	918,075	905,529
			Depreciation, etc., funds...	520,977	459,879
			Undiv. sur. (sub. cos.).....	.....	2,164
			Surplus.....	964,845	810,694
Total.....	$7,233,417	$7,039,297	Total.....	$7,233,417	$7,039,297

x Includes 49,869 8-18 shares pref. and 99,738 16-18 shares common stock issued in acquiring properties represented by stock, par value of which is $448,250, and 19,063 shares com. issued for cash, par value $19,063, total $4,507,313. y Current liabilities include accounts payable, $87,825; accrued pay-rolls, $33,040 drafts in transit, $21,130; accrued taxes, $33,040.

Lehigh Valley Coal Co.

This company reports for the fiscal year ended June 30, 1916, as follows:

Results—Our total net income from all sources, after deducting charges for royalties, sinking funds, depreciation of the property and interest on the funded debt, amounted to $1,094,922, an increase of $72,107. While the results generally may be considered satisfactory, the net revenues have nevertheless been somewhat curtailed by unusual labor conditions and the very substantial increases in the prices of all materials and supplies, particularly powder and steel.

Production—The production of anthracite coal from the lands owned and leased, including that mined by tenants, was 8,103,187 gross tons, an increase of 14,286 tons. The percentage of sizes above pea produced by the mining operations of the company was 65.60 per cent., an increase of 0.19 per cent. The bituminous coal mined from the Snow Shoe lands, located in Center County, Penn., amounted to 261,004 gross tons, an increase of 2,799 tons.

Wages, Etc.—Negotiations for a new wage agreement were conducted between the miners and the producing companies extending over a period of about six weeks, during which time the miners generally remained at work. The matter was finally concluded by granting the men an eight-hour working day and a substantial increase in wages, the agreement to run for a period of four years from Apr. 1, 1916.

Additions, Etc.—The sum of $274,544 was expended for additions and betterments. An underground electric haulage system was installed at William A. colliery and the alterations to Packer No. 4 colliery and the concentration of the underground pumping at that point have been completed. Development work preparatory to mining coal from the Broadwell lands is now under way, the prospecting done on that property having indicated that there is sufficient coal there to justify the same.

The provings on the bituminous coal land at Snow Shoe, are progressing favorably. The introduction of electric power for hauling, pumping and the coal-cutting machines, which was recently completed, will make it possible to produce an increased tonnage with much greater efficiency. The operations at Prospect colliery were seriously handicapped in December, 1915, as a result of an extensive cave-in at the abandoned workings of the Hillman colliery, which carried with it the bed of Mill Creek. On Dec. 7, 1915, we leased the coal under the Pettebone property, which contains 470 acres, between Maltby and Westmoreland collieries.

State Taxes—The Roney Act, under which a special tax of 2½ per cent. of the value of coal mined was levied by the State of Pennsylvania, has been declared unconstitutional and the money collected from customers for this tax either has been refunded or is in process of adjustment.

PROFIT AND LOSS ACCOUNT FOR YEARS ENDING JUNE 30

	1915–16	1914–15	1913–14	1912–13
Total surp. beginning year.....	$5,108,015	$4,225,685	$3,714,239	$3,486,637
Net income for year.....	1,094,922	1,022,815	564,859	1,471,275
Impts. Jan. 1, 1909, to June 30, 1912, originally deducted from income.....	.....	.....	.....	1,407,917
Total.....	$6,202,937	$5,248,500	$4,279,098	$6,365,829
Deduct				
Depreciation of impts., Jan. 1, 1909, to June 30, 1912.....	.....	.....	.....	$2,566,240
Appropriations for insur. fund.....	.....	.....	.....	50,000
Miscellaneous adjustments.....	$208,051	$73,359	$53,413	35,349
Adjust. of Pa. State taxes.....	.....	67,126	.....	.....
Total.....	$208,051	$140,485	$53,413	$2,651,590
Total surplus ending year.....	$5,994,886	$5,108,015	$4,225,685	$3,714,239

GENERAL BALANCE SHEET JUNE 30

Assets	1916	1915	Liabilities	1916	1915
Property and plant.....	$25,943,880	$24,969,597	Capital stock.....	$1,965,000	$1,965,000
Securities owned.....	200,000	200,000	Funded debt.....	19,688,000	19,892,000
Sinking fund with trus.....	2,600,387	2,570,394	Aud. vouchers.....	630,072	570,862
Advances for coal-mining rights.....	4,378,969	4,465,730	Wages due and unpaid....	570,756	517,705
Insurance fund.....	144,532	133,465	Due indiv. and cos.....	108,153	45,855
Cash.....	4,491,004	4,178,949	Royalties on coal mined, due lessee.....	30,106	40,602
Materials and supplies.....	497,756	321,830	Interest on fd. dt. due.....	298,700	303,800
Notes receivable.....	4,000	4,000	Def. real estate payments..	500,000	600,000
Due from individuals and companies.....	1,889,102	1,700,744	Miscellaneous.....	1,404,554	1,354,513
Suspended and deferred assets.....	422,812	238,175	Depreciation and other reserve.....	9,292,216	8,384,531
			Profit and loss.....	5,994,886	5,108,015
Total.....	$40,482,443	$38,782,883	Total.....	$40,482,443	$38,782,883

Funded Debt, Etc.—No new capital obligations were issued during the year. The funded debt was reduced by the purchase and cancellation through the sinking fund of $204,000 Delano Land Co. 1st M. 5s.

Balance Sheet—The increase in property and plant is due mainly to the purchase of additional property, including the land on which the Calumet Coal Storage plant, So. Chicago, is located, and to improvements to existing property. Current assets are $4,301,002 in excess of current liabilities.

Note. For previous annual report of this company see Vol. 8, p. 316.